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Zhodnocení vývoje na trhu hedgeových fondů

Evaluation of the Hedge Fund Market Development

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Contents

1 Introduction

In the history of financial development, countless investors have participated in it. In the financial sector, countless investors are thinking about getting wealth. But while pursuing rewards, they have to face the same risks. But in the process of continuous development and expansion of the financial market, some investors began to think about reducing risks through various derivatives in the financial market. In the process, hedge funds have appeared in financial markets. The development time of hedge funds is not long, but it shows its advantages to countless investors with excellent results. Therefore, more and more funds are integrated into the financial derivatives of hedge funds. The main goal of this thesis is to study the development of hedge funds through related concepts and data of hedge funds. The attention is paid to selected countries or regions, including Japan, North America, China, India, Russia. The performance of hedge funds is evaluated based on HRFX indexes that measures the overall return of hedge funds in different countries. These countries and regions included developed and developing countries. So, we can study the development of hedge funds more comprehensively.

The thesis contains five main parts. The first part is introduction, and the fifth part is conclusion. The introduction in the first part is mainly to explain the general research steps and related research topics of the full text, so that we can get the structure of the full text and the main points of the discussion in advance. The fifth part is the conclusion. Through the research results of the three parts in the middle, it is integrated to sort out the final conclusion of this thesis.

The second part is divided into four small sections. The first section focuses on the capital market itself and understands the environment in which hedge funds are located. The second section studies the investment tools in hedge funds which can help us distinguish between different types of investment tools. The third section studies the relevant concepts of investment in the capital market. At the same time, collect various important formulas used in the

investment process. The fourth section mainly studies the process of portfolio investment, from the establishment of investment strategies to the final review of investment results, and the whole process of understanding investment.

The third part mainly studies investment companies and is divided into three sections for research. The first section studies the investment company itself, its role and significance in the capital market. The second section studies the investment strategy used by investment companies, namely collective investment. We will conduct a comprehensive study on the various characteristics of collective investment itself. At the same time, it will also introduce an investment product, the relevant concepts of the fund. The third section shows the relevant characteristics of hedge fund investment companies, and at the same time lists the top ten hedge fund investment companies in the world to help us understand the unique investment models of hedge funds and hedge fund investment companies.

The main objective of the thesis is to evaluate the role of hedge funds and development of hedge fund industry, which is the fourth part of this thesis. The attention is paid to the development of the number of hedge funds and assets under management. Next, we combine the conclusions drawn in the previous two parts to study the entire process of hedge fund investment. Then, the hedge fund industry in five countries and area is assessed. We compare the data of the HFRX index from 2005 to 2019. By studying the development of hedge funds in the past 15 years, we can get data that can help us draw effective conclusions through relevant calculations. Finally, we can use these data and the formulas mentioned above to get the results we need. Through the calculated results, we can more accurately draw our conclusions.

2 Principles of Investing in Capital Market

Hedge funds are a kind of financial derivatives belonging to the capital market. Therefore, the overall environment of the capital market itself and other related financial products and their derivatives will become the objects of our research. Through this process, we can have a deeper understanding of the status and value of funds in the capital market, so that we can have a deeper understanding of hedge funds later and draw more useful and novel conclusions. In this chapter, it is divided into four small parts. The first two parts introduce the investment environment and investment objectives. In the following two parts, the investment process itself is introduced.

2.1 Main Characteristics of Capital Market

The capital market is a place for saving and investing between suppliers who have funds and those who need funds. Capitalized entities include retail and institutional investors, while they are businesses, governments and people. And capital market consists of a primary market and a secondary market. The most common capital markets are the stock market and the bond market. The capital market seeks to improve transaction efficiency. These markets bring capital holders and capital seekers together and provide a place for entities to exchange securities.

2.1.1 The Role of Capital Market

The term capital market broadly defines where various entities trade different financial instruments. These venues may include stock markets, bond markets, and currency and foreign exchange markets. Most markets are concentrated in major financial centers such as New York, London, Singapore and Hong Kong.

The capital market consists of providers and users of funds. Suppliers include households and institutions that serve them (pension funds, life insurance companies, charitable foundations, non-financial companies, etc.), and they generate cash that exceeds their

investment needs. Users of funds include home and motor vehicle buyers, non-financial companies, and governments which finance infrastructure investment and operating expenses.

The capital market is used to sell financial products such as stocks and bonds. Stocks are stocks which are ownership shares of a company. Bonds are debt securities and interest-bearing debits. And it is divided into two different categories: primary markets (issuing new equity and bonds to investors) and secondary markets (trading existing securities). Capital market is an important part of a well-functioning modern economy, because capital market moves funds from people who have them to those who need them for productive use.

Capital market can refer to any market for financial assets. Therefore, in many cases, the capital market plays an indispensable role：

- Corporate finance: In this area, capital market is a place where non-financial companies can invest capital. Investable capital includes external funds (common and preferred stocks, public bonds, and private debt) that are included in the weighted average cost of capital calculation. These external funds are also used in the calculation of return on invested capital. The capital market in corporate financing can also refer to equity financing, excluding debt.
- Financial services: Financial companies that participate in private rather than public markets are part of the capital market. They include investment banks, private equity and venture capital firms, as opposed to broker-dealers and public exchanges.
- Open market: Compared with debt, bonds, fixed income, currency, derivatives and commodity markets, the capital market can be operated through regulated exchanges, which refers to the stock market. Reflecting the company's financing environment, the capital market can also refer to stocks and debt, bonds or fixed income markets.

Capital market can also refer to investments that receives capital gains tax treatment. Although short-term gains (assets held within one year) are taxed as income based on tax

classification, long-term gains have different tax rates. These exchange rates are usually related to transactions arranged privately through investment banks or private equity funds such as private equity or venture capital.

2.1.2 Primary Market and Secondary Market

The capital market consists of a primary market and a secondary market. Modern major primary and secondary markets are mostly computer-based electronic platforms.

The primary market is open to specific investors who purchase securities directly from the issuing company. These securities are considered major offerings or initial public offerings (IPOs). After the company goes public, it sells its stocks and bonds to large institutional investors such as hedge funds and mutual funds.

On the other hand, the secondary market includes sites regulated by regulatory agencies such as the Securities and Exchange Commission (SEC), where existing or issued securities are traded between investors. The issuing company does not participate in the secondary market. Examples of secondary markets are the New York Stock Exchange (NYSE) and Nasdaq, and the Shanghai and Shenzhen markets in China.

2.2 Types of Capital Market Instruments

The most widely used financial instruments in the capital market are stocks and bonds. Investors can purchase these instruments directly, or they can invest through investment funds, which are especially suitable for individual investors. The mentioned financial instruments and the main principles of collective investment are described in this chapter.

2.2.1 Main Features of Stocks

The stock market is any exchange that allows people to buy and sell stocks and companies to issue stocks. A stock can represent the company's equity, and shares are pieces of this company.

Stocks are securities that represent an ownership share in a company. For companies, issuing stock is a way to raise money to grow and invest in their business. For investors, stocks are a way to grow their money and outpace inflation over time. When we own stocks in a company, we are called a shareholder because we share in the company's profits.

Public companies sell their stock through a stock market exchange, like the Nasdaq or the New York Stock Exchange. Investors can buy and sell these shares among themselves through stockbrokers. The stock exchanges track the supply and demand of each company's stock, which directly affects the stock's price.

There are two main types of stocks: common stocks and preferred stocks. Most investors own common stock in a public company. Common stock may pay dividends to shareholders, but dividends are not guaranteed, and the amount of the dividend is not fixed. Preferred stocks typically pay fixed dividends, so owners can count on a set amount of income from the stock each year. Owners of preferred stock also stand at the front of the line when it comes to the company's earnings: Excess cash distributed by dividend is paid to preferred shareholders first, and if the company goes bankrupt, preferred-stock owners receive any liquidation of assets ahead of common-stock owners (Voigt and O'shea, 2020).

For understanding the stocks better, it is necessary to learn the history of stocks in the world. History can tell us the meaning of its existence.

The stock has a history of nearly 400 years, and it appeared with the emergence of joint-stock companies. With the expansion of business scale and insufficient capital requirements, a way is required for companies to obtain a large amount of capital. As a result, an enterprise organization appeared in the form of a joint-stock company and was jointly funded by

shareholders. The change and development of joint-stock companies have generated financing activities in the form of stocks; the development of stock financing has generated the need for stock trading; the demand for stock transactions has contributed to the formation and development of the stock market; and the development of the stock market has finally promoted stock financing activities And the improvement and development of joint stock companies.

The earliest joint stock company system in the world was born in the East India Company established in 1602 in the Netherlands. After the emergence of the corporate organization form of the joint-stock company, it was quickly widely used by capitalist countries and became one of the important forms of corporate organization in capitalist countries. Along with the birth and development of joint-stock companies, the method of raising capital and holding shares in the form of stocks has also developed, and there has been a need to buy and sell stocks to transfer stocks. In this way, the emergence and formation of the stock market is promoted, and the stock market is improved and developed. In 1611, the shareholders of the East India Company traded on the Amsterdam Stock Exchange, and later had a special broker to match up the transaction. The Amsterdam Stock Exchange has formed the world's first stock market, and now a company limited by shares has become one of the most basic forms of corporate organization; stocks have become an important channel and method of financing for large enterprises, and it is also a basic choice for investors to invest. The stock market (including the issuance and trading of stocks) and the bond market have become important basic contents of the securities market (BAIDU, 2019).

2.2.2 Main Features of Bonds

The bond market—often called the debt market or credit market—is a financial marketplace where investors can trade in government-issued and corporate-issued debt securities. Governments typically issue bonds in order to raise capital to pay down debts or fund

infrastructural improvements. Public-traded companies issue bonds when they need to finance business expansion projects or maintain ongoing operations.

Although there are various types of bonds, they must contain some basic elements in contents. These elements refer to the basic contents that must be stated on the bonds issued. This is the main agreement that clarifies the rights and obligations of creditors and debtors, including:

Face value of bonds: The face value of a bond refers to the face value of the bond, the amount of principal that the issuer should pay to the bond holder after the bond matures, and the calculation basis for the company to pay interest to the bond holder on time. The face value of a bond is not necessarily the same as the actual issue price of the bond. An issue price greater than the face value is called a premium issue, a value smaller than the face value is called a discount issue, and an equivalent issue is called a parity issue.

Repayment period: The bond repayment period refers to the period of repayment of the principal of the bond stated on the corporate bonds, that is, the time interval between the date of issue of the bond and the maturity date. The company shall determine the repayment period of corporate bonds by combining its own capital turnover and various factors affecting the external capital market.

Interest period: The interest payment period of a bond refers to the period of interest payment after a company issues a bond. It can be paid once due, or once a year, half a year, or 3 months. Considering the time value of money and inflation, the interest payment period has a great impact on the actual returns of bond investors. For bonds that pay a single interest due, the interest is usually calculated as simple interest; for bonds that pay interest in installments during the year, the interest is calculated as compound interest.

Coupon rate: The coupon rate of a bond refers to the ratio of the bond interest to the face value of the bond and is the calculation standard for the issuer's promise to pay the bond holders a certain period of time in the future. The determination of the coupon rate of bonds is mainly affected by factors such as bank interest rates, the issuer's credit status, repayment terms and

interest calculation methods, and the supply and demand of funds in the capital market at the time.

Issuer name: The issuer's name indicates the debtor of the bond and provides a basis for creditors to recover the principal and interest at maturity.

The above-mentioned elements are the basic elements of the face of the bond, but they are not necessarily printed on the face of the issue at the time of issuance. For example, in many cases, the issuer of the bond issues the term and interest rate of the bond to the society in the form of announcements or regulations (BAIDU, 2005).

There are many classifications of bonds. It is best to distinguish between bonds by different issuers. The following are the types of bonds that are distinguished by the issuers. And because the systems of different countries are different, there will be some differences in the classification of bonds, so taking the US bonds as an example.

Corporate Bonds: Companies issue corporate bonds to raise money for a sundry of reasons, such as financing current operations, expanding product lines, or opening new manufacturing facilities. Corporate bonds usually describe longer-term debt instruments that provide a maturity of at least one year.

Government Bonds: National-issued government bonds entice buyers by paying out the face value listed on the bond certificate, on the agreed maturity date, while also issuing periodic interest payments along the way. This characteristic makes government bonds attractive to conservative investors.

Municipal Bonds: Municipal bonds—commonly abbreviated as "muni" bonds—are locally issued by states, cities, special-purpose districts, public utility districts, school districts, publicly-owned airports and seaports, and other government-owned entities who seek to raise cash to fund various projects.

Agency bond: Agency bonds are those issued by government-affiliated organizations such as Fannie Mae or Freddie Mac (Heyes, 2020).

2.2.3 Investors in the Capital Market

The capital markets are used by both firms and governments to raise funds for long term use, though most investment by firms is financed by retained profits. Firms can issue corporate bonds and various types of shares, while governments issue bonds. Ordinary company shares entitle their holders to a share of the firm's profits and thus pay variable dividends. They should also experience capital growth over time. Bonds usually pay a fixed rate of interest at pre-determined intervals. Both bonds and shares are traded on a stock exchange and their price fluctuates in response to supply and demand. In the short run the supply of both is fixed and price fluctuations are therefore the result of changes in demand. Our conventional theory says that the price people are willing to pay for such securities reflects the value which they place upon the future income from those securities, given the level of risk associated with them. The value placed upon the future income depends upon what can be earned elsewhere and thus varies with changes in interest rates. In the case of shares, the value placed on the income depends upon the income itself, which can change as a result of the firm's profitability. In practice, share and bond prices are affected by a wide range of influences whose relevance is that they lead investors to expect changes in interest rates, risk or profits (Howells, 2007).

2.3 Main Principles of Investment in Capital Market

After the previous introduction, the thesis explained some of the important roles in the capital market, so there are enough introductions to some important concepts of the capital market. However, since it is a market, there will be investment behavior, and this is also an important part of it. After all, all of this is to make money from it, and investment is the first step.

2.3.1 Definition of Investment

An investment is the current commitment of money for a period of time in order to derive future payments that will compensate the interest for these factors:

- The time the funds are committed;
- the expected rate of inflation during this period;
- the uncertainty of future payment.

Investing is a process, an action. When a rational investor wants to invest, the investment process is generally divided into the following five steps:

- How to decide. First of all, we need to know what our investment goals are, what we are investing for, to stabilize our income after retirement, or just to get wealth. This will directly determine what we invest in and has an important guiding role on how to follow up.
- How much to invest. We should check our wealth. Because of investment has risk, we need to think carefully about the proportion of our own investment as percentage in our total wealth.
- What to invest. We should choose a suitable investment object. It can be a stock, also can be a fund. In the capital market, there are many finance derivatives. It is very important to choose a finance derivative that matches the market at the time.
- When to invest. Choosing a suitable time and starting investing. Here is some information that affect the financial market, and the information is updated all the time. Choosing a suitable time can also be said to pinpoint some favorable information, which is very important for investment.
- For how long to invest. Determine an investment cycle based on needs. The impact of a favorable message on the financial market is also limited, so how to use its time to

obtain benefits is the purpose of investment, so after completing the previous steps, this final step is also the key to deciding whether to succeed (Fabozzi, 2009).

2.3.1 Investment Triangle

Investment triangle includes liquidity, risk and return. There is a trade-off relationship before these three criteria and investors typically choose among them. For example:

- Return maximization at the given level of risk.
- risk maximization at the given level of return and liquidity.

After introducing their previous theories (Fabozzi, 2013). In order to make the concept breakthrough in the paper more perfect, the thesis should also make clear their respective concepts, so their meanings and main forms of expression, as follows:

a) Return

A return is the gain or loss of a security in a particular period.

The return consists of the income and the capital gains relative on an investment, and it is usually quoted as a percentage. For example, income return includes dividend, interest, coupon payment, or capital gain/loss. The general measure of returns is to use historical data for a period of time to show. In order to draw conclusions more easily, some formulas must be used to process the data to help draw conclusions. The first is holding period return (2.1):

$$r_t = \frac{P_1 - P_0}{P_0} \tag{2.1}$$

where P_1 is the market value at the end of the interval, P_0 is the market value at the beginning of the interval.

According to the above formula, a more practical formula can be deduced. It is annual holding period return (2.2):

$$r_{p.a.} = \sqrt[n]{\frac{P_1}{P_0}} - 1 \tag{2.2}$$

where n is number of years of the investment.

The previous way how the holding period return can be calculated (2.1) ignore some factors that might have an effect on the final return. We can use the following formula (2.3) to calculate the net historical rate of return:

$$r_t = \frac{P_1 - P_0 + D - T - C}{P_0} \tag{2.3}$$

where r_t is the historical rate of return in interval "t", P_1 is the market value at the end of the interval, P_0 is the market value at the beginning of the interval, D is the cash distribution to the investor, T is the taxes and C is the transaction costs.

In actual calculations and comparisons, we usually use this formula (2.3), which can reflect a relatively accurate rate of return over a period of time. At the same time, it can compare effectively with the data obtained by other subsequent formulas.

The last important formula is to calculate the average rate of return, and two different algorithms are used in the process of calculating it. One is arithmetic mean return (2.4), another one is geometric mean return (2.5):

Arithmetic Mean Return (AM):

$$r_A = \frac{r_1 + \cdots + r_n}{n} \tag{2.4}$$

Geometric Mean Return (GM):

$$\left(\prod_{i=1}^{n} r_i\right)^{\frac{1}{n}} = \sqrt[n]{r_1 r_2 \dots r_n} \tag{2.5}$$

where $\boldsymbol{r_1, r_2, \dots, r_n}$ are returns for each period, n is number of periods.

When multiple periods are involved and an average return is sought, these two formulas (2.4, 2.5) can be used well. Therefore, in the subsequent model building process, in order to better compare the returns and risks brought by a company's work in a longer period, the data obtained above will also be used.

The above formulas are used when analyzing through historical data, but if we want to make predictions for a period of time in the future, we should use the following formula (2.6) to calculate the expected rates of return:

$$E_{R_i} = \sum_{i=1}^{n}(P_i)(R_i) \tag{2.6}$$

where P_i is probability for possible return i, R_i is possible return i.

b) Risk

Anytime we invest money into something, there is a risk, whether large or small, that we might not get our money back. In return, We look forward to a positive return, which compensates we for bearing this risk (returns may be zero or negative). Describing risk in this way is still slightly abstract, so it is necessary to use risk quantification to compare and compare, for example statistical measures such as variance and standard deviation of returns.

At the same time, there are many forms of risk, which are mainly divided into systematic and non-systemic risks:

- Systematic risk characteristics: Market risk; Associated with the state of economy, country; Cannot be eliminated by diversification.
- Sources of systematic risk: Political risk; Economic risk; Exchange-rate risk; Interest rate risk; Inflation risk; Liquidity risk; other risk.
- Unsystematic risk characteristics: Associated with individual security or issuer; Can be eliminated by diversification.

- Source of unsystematic risk: Business risk; Financial risk; Liquidity risk; Management risk.
- Total risk = Systematic risk + Unsystematic risk.

Systemic risk generally refers to the inevitable risk. The systemic risks brought by the shortcomings of this investment method itself. Usually caused by some uncontrollable factors, like the above risks, they cannot be controlled by investors. Non-systemic risk is just the opposite of systemic risk. It can be controlled artificially. In other words, it is itself a risk caused by human factors.

At the same time, based on historical rates of return and the average rate of return achieved during a given time period. We can use the following formula (2.7) to calculate the historical risk:

$$\sigma^2 = \frac{\sum_{t=1}^{T}(r_t - r_A)^2}{T} \tag{2.7}$$

where σ^2 is variance, r_t is the historical rates of return, r_A is the average historical rate of return, T is the number of time periods. For interpretation, we can use the following formula (2.8):

$$\sigma = \sqrt{\sigma^2} = \sqrt{\frac{\sum_{t=1}^{T}(r_t - r_A)^2}{T}} \tag{2.8}$$

where σ is standard deviation.

In general, the higher the variance or the standard deviation, the higher the level of risk. Because historical data itself is derived from actual investment operations, it has a guiding role for future investment. The above formula uses these historical data to obtain some reasonable answers through some mathematical methods. Maybe this answer does not have 100% accuracy, but it can be used as a reference object for investors to think rationally. Through the calculated results, investors can draw more correct conclusions through relevant theories (Bodie, 2011).

c) Liquidity

In the financial field, liquidity directly refers to the difficulty of converting financial derivatives into cash. Generally speaking, the easier it is to convert to cash, the higher the liquidity. Conversely, the more difficult it is to convert to cash products, the lower the liquidity. Of course, this is just a general conclusion without considering the actual many factors.

Under this premise, if an asset or security can be easily bought or sold with little or no impact on price, we will call them the liquid asset or security.

For example, financial instruments with high liquidity: T-bills, highly traded shares (blue chips) and so on. T-bills are short-term national bonds, so it can achieve high liquidity, and blue chips stocks refer to company stocks that are leading in various industries, have large amounts of capital, and have stable development prospects. The volatility of these stock prices is not large, and under normal circumstances there will be no suspension or other untradeable situations. Of course, correspondingly, their income will not be high.

But it seems that this concept is still very abstract, and it is not easy to compare with the first two. Therefore, we need some reference objects that can redefine the liquidity. Through research, we finally get the following reference objects for measuring liquidity:

Volume of trades; Average spread (bid-ask spread); Transaction costs; Market capitalization; Ratio of daily trades to market capitalization.

Investors can easily obtain historical data of the invested objects on the relevant investment website. When an investor selects one or more financial derivatives to prepare for investment, the data can be used to roughly estimate the liquidity of the financial derivative, so as to better integrate their own actual situation to make a rational investment (BROWN, 2011).

2.4 The Portfolio Investment Process

Although we mentioned investment in the research in the previous sections, it is a description of the investment process of a general rational investor, and there will be more

details in the actual investment process of professional investment workers. Therefore, after understanding the investment process of general rational investors, we must continue to deepen the research of the investment process. Since the objective of the work is studying hedge funds which are part of the capital market, the portfolio investment process is described here.

Phases of investment process: Choice of strategy; Analysis of investment instruments; Portfolio creation; Revision and evaluation of portfolio performance.

2.4.1 Choice of Strategy

Before investing, we must first determine what our goals are, what we expect, and how much risk we can take. When the above points are determined, we need to determine our investment strategy based on these, which is the first step in investing.

a) The statement of investment objectives and constraints

Before investing, the investment objectives must be determined. According to the research, there are four main investment objectives:

Capital appreciation. Capital appreciation is an increase in the price or value of assets. It may refer to appreciation of company stocks or bonds held by an investor, an increase in land valuation, or other upward revaluation of fixed assets (Wikipedia, 2012);

Total return. The total return on a portfolio of investments considers not only the capital appreciation on the portfolio, but also the income received on the portfolio. The income typically consists of interest, dividends, and securities lending fees (Wikipedia, 2005);

Current income. The current income that can be obtained during the investment process can also be said to be the current income that can be expected;

Capital preservation. Because investment behavior is risky, the preservation of principal is also an important goal of the investment process. Any successful investment portfolio will focus on capital preservation.

Specification of amount to be invested. Through the above points, to determine the specific amount of investment we want to invest. No matter what is invested, how to invest, capital is always fundamental.

Although the choice of investment strategy has a certain relationship with the personality of the investor itself, it is largely determined by some objective conditions of the investor itself. So, after we rationally and objectively recognize the situation of the above points, we must choose the investment strategy that suits us best. There are currently two main investment strategies:

One is a positive investment strategy with profit as the main investment purpose. This investment strategy will pay more attention to income, and generally it is the investment strategy that the investor himself has a confident estimate of the development of some financial products. Of course, there is an inevitable high risk due to the pursuit of high returns.

The other is a passive investment strategy with principal as the main investment purpose. The risk is relatively small. Therefore, at the same time the return will be reduced. This investment strategy is mainly for investors with large enough principals or pursuing low risks. Mainly pay attention to guarantee a stable income in the case of principal.

b) Investment strategy

After choosing a suitable investment strategy, it is to execute the strategy. According to the research, a rational investment strategy is mainly based on the following four decisions:

- What asset classes to consider for investment.
- What policy weights to assign to each eligible class.
- What allocation ranges are allowed based on policy weights.
- What specific securities to purchase for the portfolio.

In the process of implementing an investment strategy, the four points mentioned above are important decision-making processes. The success of an investment strategy also has an

important relationship with these four decisions. At the same time, some of the following research is also carried out in order to make the above-mentioned decisions better. In short term, the investment strategy can be regarded as the outline of the entire investment process, and these decisions are the main points in the outline.

2.4.2 Analysis of Investment Instrument

Because there are many investment instruments, the returns and risks brought by each investment instruments are different under different circumstances. Therefore, it is necessary to understand the situation of the environment and analyze the various investment tools. The risks and rewards to make a relatively rational choice.

a) Technical Analysis

Technical analysis refers to the sum of the methods of taking market behavior as the research object to determine market trends and subsequent gradual changes in trends for stocks and all financial derivative transactions.

All technical analysis is based on three major assumptions. First, market behavior is inclusive and digestive. In other word, all the basic events-economic events, social events, wars, natural disasters and other factors that affect the market will be reflected in price changes. Second, prices evolve in a trending manner. Third, history repeats itself.

Based on the above three assumptions, analytical approach that uses price and volume data (often graphically displayed) in decision making. Price can be projected with charts and other technical tools.

The advantages of technical analysis: It has the remarkable characteristics of comprehensive, direct, accurate, strong operability and wide application range. Compared with the basic analysis, the technical analysis of the transaction is quicker and the cycle of obtaining benefits is shorter. In addition, technical analysis responds more directly to the market, and the

results of the analysis are closer to the local phenomenon of the actual market. The market position obtained through market analysis is often more accurate than basic analysis.

The disadvantage of technical analysis is that the scope of consideration is relatively narrow, and it is difficult to effectively judge the long-term market trend. Basic analysis is mainly applicable to market forecasts with relatively long periods and areas where forecast accuracy is not high. Compared with basic analysis, technical analysis is more suitable for short-term market forecasting. To perform a longer period of analysis, we must refer to basic analysis. This is the most important issue for applying technical analysis. Because technical analysis is a summary of experience rather than a scientific system, the conclusions obtained through technical analysis and the trading operations performed thereby need to bring returns to investors in the form of probability.

b) Fundamental Analysis

Fundamental analysts believe securities are priced according to fundamental economic data. One of the primary assumptions of fundamental analysis is that the price on the stock market does not fully reflect a stock's "real" value. And the true value is known as the intrinsic value. Therefore, the basic analysis will use many mathematical tools to analyze the data through rational calculations to obtain relevant actual data, so as to make corresponding judgments, so the investment made after this analysis is generally called value investment.

Qualitative and quantitative analysis. Qualitative analysis is a rough analysis based on some related properties or some historical events. Quantitative analysis is based on actual data and related accurate calculations.

Fundamental analysis advantages: Able to comprehensively grasp the basic trend of securities prices; relatively simple to apply.

Disadvantages of fundamental analysis: The time span of the forecast is relatively long, and the guidance role for short-term investors is weak; the accuracy of the forecast is relatively low.

Based on the above research, we can also see some limitations of the basic analysis. Because there are many factors that affect the financial market, the price of financial products and their own value are likely to make a huge difference in the short term. Therefore, fundamental analysis applies to the following areas: Securities price prediction with a relatively long period; relatively mature securities markets; suitable for areas where forecast accuracy is not high.

2.4.3 Portfolio Creation

First of all, we must select specific assets in suitable financial products to enter our investment portfolio, and then optimize them through the research of related technologies and professional investment workers to make this portfolio more in line with the market. Then through some quantitative tools to directly calculate the return and risk that the portfolio can bring, and at the same time make a reasonable expectation, such a rational portfolio is completed. Of course, in the process of building an investment portfolio, we must always pay attention to the diversity of assets. Diversification can reduce portfolio risk without sacrificing return.

2.4.4 Revision and Portfolio Performance Evaluation

Since the financial market is constantly changing, the investment portfolio will also perform differently in different periods. Therefore, in order to achieve the goal successfully, the investment portfolio must be continuously adjusted and rebalanced according to the actual situation. At the same time, investors' own situation is not always the same. Therefore, a successful investment portfolio must be able to make continuous adjustments based on various factors.

High-end technology and excellent fund managers just give investors a good expectation, and it is their own performance that really reflects the success of a portfolio. Portfolios that can

bring target returns even higher than target returns will always be successful. So, the performance evaluation is also an important part of a successful portfolio. Therefore, for investors who deliver funds to professional investment workers, investor performance must periodically be evaluated by the investor to assess progress toward the achievement of investment objectives.

3 The Role of Investment Companies

An investment company is a financial intermediary that pools the funds of individual investors and invests in many securities or other assets. "Concentrated assets" is the core meaning behind securities investment companies. In the securities portfolio established by the investment company, each investor enjoys the right to claim the asset portfolio according to the proportion of the investment amount. These investment companies provide a mechanism for small investors to organize themselves to reap the benefits of large-scale investments.

Generalized investment company refers to an enterprise organization that brings together a large number of funds and makes reasonable combinations based on investment objectives. It includes financial institutions such as trust and investment companies, financial companies, investment banks, fund companies, commercial banks, and insurance companies, as well as various types of enterprises involved in equity investment and securities investment. Its business scope includes buying stocks and bonds of enterprises, participating in the establishment and operation of enterprises, providing medium and long-term loans, operating domestic and foreign government bonds, fund management, etc. The source of funds is mainly the issuance of its own bonds, stocks or fund units. Other banks obtain loans and accept entrusted deposits. The investment company in the narrow sense specifically refers to the main body of a company-type investment fund. This is a for-profit limited company formed according to law. Investors become shareholders through the purchase of company shares.

3.1 Characteristics and Types of Investment Companies

Although investment companies have many different businesses, they have some common characteristics. If we want to better understand the hedge fund, we have to first understand the main body of its operation, the relevant content of the investment company.

3.1.1 Characteristics of Investment Companies

In the capital market, investment companies play an indispensable role. Investment companies have achieved the following important functions for investors:

- Record keeping and management: Investment companies issue periodic management reports that record the distribution of capital, dividends, investments, and principal redemption; at the same time, they can reinvest interest and dividend income for investors.
- Diversity and Divisibility: Through concentration of assets, investment companies enable investors to hold part of many securities. Individual investors can't operate like big investors, but investment companies have made it happen.
- Expert management: Most (but not all) investment companies have full-time securities analysts and securities managers who work on securities to obtain the best investment results.
- Low transaction costs: Because investment companies conduct large transactions, they can save a lot of money on brokerage fees and commissions.

3.1.2 Types of Investment Companies

According to the business content of an investment company to distinguish its business type, we can look at the specific content of several investment types.

Equity investment companies: It refers to the shares of the invested unit obtained through investment. Specifically, it refers to the stocks of other enterprises purchased by the enterprise or direct investment in other units with monetary funds, intangible assets and other physical assets, with the ultimate purpose of obtaining greater economic benefits.

Debt investment companies: It refers to the investments made to obtain creditor's rights, such as the purchase of corporate bonds and the purchase of treasury bills. Investment Co., Ltd.

makes this kind of investment not to obtain the remaining assets of other enterprises, but to obtain interest higher than the interest rate of bank deposits, and to guarantee the recovery of principal and interest on schedule.

Securities investment companies: It refers to an investment behavior in which investors obtain dividends, interest and capital gains by purchasing securities, financial derivatives and other products (BAIDU, 2006).

3.2 Principles of Collective Investment

A collective investment scheme is a financial investment vehicle, which is aimed at private investors – little or large – or institutional investors – insurance companies, bank, pension funds, hedge funds, other financial institution.

3.2.1 Subjects of Collective Investment

Main subjects of collective investment are investment companies and funds. They sell shares (units) to the public and invest the proceeds in a diversified portfolio of securities.

Each share sold represents as a proportionate interest in the portfolio of securities managed by the investment company on behalf of the companies' shareholders. The types of securities purchased depends on the company's investment objectives. It is precisely because collective investment is mainly carried out by investment companies and funds. So, we look at investment companies and funds from this perspective, they have a significant advantage over other individual investment behaviors.

3.2.2 Key Advantages and Disadvantages of Collective Investment

Advantages of collective investment: Risk is spread and therefore reduced. Because collective investment is the operation of many individuals or companies who hand over funds

to professional investment companies, and investment companies have a series of systems and policies to restrict them, and they have professional teams to manage them to reduce risks; Professional, expert and full-time investment management expertise; Funds are cost effective. Funds invested into fund companies are viewed as the cost of investors, so they also have cost-related characteristics; Funds offer access to markets that may otherwise be closed or too technical for retail/individual investors; General investors don't need to learn knowledge about financial or investment; Collective investment will be more safety because of strict regulation of funds.

For small investors, there are two special advantages:

It is possible to invest small amounts of money. When we invest in certain financial products, it may be difficult to participate because the amount of investment is too small. At this time, collective investment can solve the problem of not being able to participate, which is another opportunity for investors who can use it for a small amount of investment.;

It is possible to invest regularly. Because collective investment generally seeks to guarantee a stable return on principal, so for small investors with few funds, they can make multiple regular investments to obtain a return rate similar to that of large investors.

Disadvantages of collective investment:

No free hand in investor investing. Collective investment is the act of general investors delivering funds to professional investment companies to participate in investment. So, for ordinary investors, this fund is not dominated by itself;

Investing in financial markets must have risk. Although the investment risk of collective investment is relatively small compared to most investment behaviors, as long as it is an investment, there must be risks. Since participating in investment behaviors, we must have the consciousness to bear the corresponding risks;

Because the funds are invested with professional investors, there will be a cost other than investment. We need to pay an additional fee to the relevant agency.

3.2.3 Definition of Fund

There are many investment tools, and the fund is an important part of it. Since our ultimate goal is to introduce hedge funds, we will focus on the relevant information of the fund first.

a) Explanation of the Fund

A fund is a pool of money that is allocated for a specific purpose. A fund can be established for any purpose whatsoever, whether it is a city government setting aside money to build a new civic center, a college setting aside money to award a scholarship, or an insurance company setting aside money to pay its customers' claims.

Individuals, businesses, and governments all use savings to reserve funds. Individuals can set up emergency funds or rainy funds to cover unforeseen expenses, or they can set up trust funds to set aside funds for specific people.

Individual and institutional investors can also put money into different types of funds with the goal of making money. For example, mutual funds collect funds from numerous investors and invest them in a diversified portfolio of assets; hedge funds invest the assets of high net worth individuals (HNWIs) and institutions earn higher-than-market returns. The government uses funds such as special income funds to pay for specific public expenditures.

b) Common Types of Funds

Through the above research, we have a theoretical conceptual understanding of the fund, but understanding the examples that exist in reality is always the most helpful way to understand. Therefore, through the general classification of funds in reality, to introduce some of the more common funds in real life. According to the different investment objectives and investors, it will be divided into three categories to introduce.

Some examples of funds commonly used for personal ventures:

- Emergency funds are personal savings vehicles created by individuals used to cover periods of financial hardships, such as job loss, prolonged illness or a major expense.

The rule of thumb is to create an emergency fund that contains at least three months' worth of net income.

- College funds are usually tax-advantaged savings plans set up by families to allocate funds for their children's college expenses.
- Trust funds are legal arrangement set up by a grantor who appoints a trustee to administer valuable assets for the benefit of a listed beneficiary for a period, after which all or a portion of the funds are released to the beneficiary or beneficiaries.
- Retirement funds are savings vehicles used by individuals saving for retirement. Retirees receive monthly income or pensions from retirement funds.

Some examples of funds used for investing:

- Mutual funds: Mutual funds are investment funds managed by professional managers who allocate the funds received from individual investors into stocks, bonds, and/or other assets.
- Money-market funds: Money-market funds are highly liquid mutual funds purchased to earn interest for investors through short-term interest-bearing securities such as Treasury bills and commercial paper.
- Exchange-traded funds: Exchange-traded funds (ETFs) are like mutual funds but traded on the public exchanges like stocks.
- Hedge funds: Hedge funds are investment vehicles for high-net-worth individuals or institutions designed to increase the return on investors' pooled funds by incorporating high-risk strategies such as short selling, derivatives, and leverage.
- Government bond funds: Government bond funds are for investors looking to put their money away in low-risk investments through Treasury securities, such as Treasury bonds, or agency-issued debt, such as securities issued by Fannie Mae. Both alternatives are backed by the U.S. government.

Some funds created by government:

- Debt- service funds: Debt-service funds are allocated to repay the government's debt.
- Capital projects fund: Capital projects fund resources are used to finance the capital projects of a country, such as purchasing, building or renovating equipment, structures, and other capital assets.
- Permanent funds: Permanent funds are investments and other resources that the government is not allowed to cash or spend. However, the government normally has the right to spend any revenue these investments generate on appropriate functions of government (Kagan, 2019).

3.3 Hedge Fund Companies

In order to better understand the characteristics of hedge fund investment companies, we introduced the relevant characteristics of hedge fund investment companies in this section and listed the top ten hedge fund investment companies in the world. The existence form of the fund in real life.

3.3.1 Investing in Hedge Fund Companies

According to data group HFR, there are more than 15,000 hedge funds managing about $3 trillion worth of assets worldwide. Most of them are located in and around New York City. Unlike banks and other financial institutions, hedge funds don't attract much regulatory scrutiny even though they manage trillions of dollars' worth of assets.

Hedge funds are notoriously secretive. Not all investors can invest in them, because their minimum investment is $500,000 or higher. Hedge funds charge ridiculously high fees – typically 2% of assets under management and 20% of gains.

Therefore, hedge fund companies must ensure that their investment return rate is higher than the above-mentioned charging standards in order to be recognized by investors and sufficient returns. At the same time, it is not difficult to find that hedge funds are based on the investment behavior of a huge capital pool, so the volume is generally relatively large, and of course, the professional investors involved are also leaders in the financial field.

3.3.2 Top 10 Biggest Hedge Fund Companies

Hedge funds are investment funds that aim to generate positive returns for their investors in both bull and bear markets. They design their strategies to protect our portfolio from market uncertainties. They employ both long and short strategies, and invest across stocks, bonds, gold, derivatives, currencies, and commodities. In recent years, they have been using complex algorithms and analytical practices to generate alpha.

The ranking is based on data from Pensions & Investments and ADV Ratings. Many of them also manage public funds and employ non-hedge fund strategies. For this ranking, we have considered only assets following hedge fund strategies.

a) Davidson Kempner Capital (10th)

Headquartered in New York City, Davidson Kempner Capital Management has about $30.8 billion in assets under management as of June 2019. This hedge fund employs five strategies – long/short equity, distressed investments, merger arbitrage, convertible bonds arbitrage, and long/short credit. Davidson Kempner also has additional offices in London, Hong Kong, Dublin, and Philadelphia.

b) Citadel (9th)

Led by billionaire hedge fund manager Kenneth Griffin, Citadel has $32.24 billion in AUM. It has more than 1400 employees worldwide. The Chicago-based hedge fund focuses on equities, fixed income, commodities, credit, and quantitative strategies. It was named the Institutional Hedge Fund Manager of the Year at Institutional Investor Awards 2019.

c) BlackRock (8th)

Founded in 1988, BlackRock is the world's largest asset management firm with $7.4 trillion of assets under management at the end of 2019. Experts have called it the world's largest shadow bank because of its mammoth size. However, it has only $32.9 billion allocated to hedge fund strategies, according to Pensions & Investments. It has about 13,000 employees in more than 30 countries.

d) Elliott Management (7th)

Founded in 1977 by Paul Singer, Elliott Management is a privately-owned hedge fund. It has $37.7 billion in AUM as of June 2019. Elliott is one of the world's largest activist funds. Many refer to it as a vulture capital fund because it invests mainly in distressed securities. Last year, it acquired Barnes & Noble retail bookstore chain for $683 million. In 2017, Elliott Management had raised a staggering $5 billion from investors in less than 24 hours.

e) Millennium Management (6th)

New York-based Millennium Management was founded in 1989 by Israel Englander. According to Pensions & Investments, it has $38.7 billion in AUM as of June 2019, which swelled to $40 billion by the end of December 2019. It deploys money in a variety of investment strategies including equities, currencies, futures, and asset-backed securities.

f) Two Sigma Investments (5th)

Two Sigma was founded in 2001 by a team of computer scientists and mathematicians. It uses cutting-edge technologies such as artificial intelligence, machine learning, and distributed computing for its trading strategies. Two Sigma has $42.9 billion in AUM as of June 2019. Headquartered in New York City, it has additional offices in London, Hong Kong, and Japan.

g) AQR Capital Management (4th)

Greenwich, Connecticut-based AQR Capital is the fourth biggest fund in the world with $60.8 billion in AUM. It employs about 1,000 people in Greenwich, Chicago, Boston, Los Angeles, London, Tokyo, Hong Kong, and Frankfurt. AQR Capital uses quantitative analysis and computer models to make investment decisions.

h) Man Group (3rd)

Man Group is the only non-US hedge fund on this list. London-based Man Group traces its origins to 1783, when James Man established it as a sugar cooperage and brokerage. It's now the world's largest publicly traded hedge fund with $62 billion in AUM as of June 2019. It is by far the largest hedge fund in Europe. Man Group also has offices in New York, Boston, Hong Kong, Tokyo, Sydney, and Switzerland.

i) Renaissance Technologies (2nd)

Founded by noted mathematician Jim Simmons in 1982, Renaissance Technologies is a highly secretive hedge fund with an incredible track record. Its flagship Medallion fund has returned a staggering 66% annually before fees and 39% after fees between 1988 and 2018. Jim Simmons is an award-winning mathematician and a Cold War-era code breaker for the National Security Agency. Renaissance Technologies employs complex mathematical models to analyze and execute trades. It has $68 billion in AUM as of June 2019.

j) Bridgewater Associates (1st)

Founded in 1975, Westport, Connecticut-based Bridgewater Associates is the largest hedge fund in the world. According to Pensions & Investments, it has $132 billion in AUM as of June 2019. By the end of 2019, its assets under management jumped to $160 billion. Bridgewater Associates had a lackluster year in 2019, gaining just $600 million for its investors. Bridgewater Associates uses a global macro investing strategy based on economic trends. Since its inception, the hedge fund has gained $58.5 billion for its investors. (SHUKLA, 2020)

4 Evaluation of Hedge Fund Market Development

After understanding the relevant concepts of capital markets, investment and funds, we went to the topic to understand the related content and development of hedge funds. This chapter is composed of four parts. The first three parts are all about the actual development of the hedge fund itself and some time ago and will be compared in different general environments. The last part is to make reasonable expectations and prospects for the future development of hedge funds through reasonable analysis of relevant data.

4.1 Characteristics of Hedge Fund

Hedge funds are alternative investments that use collective funds. Collective funds use different strategies to earn positive returns for their investors, namely alpha. Hedge funds can actively manage or use derivatives and leverage in domestic and international markets to generate high returns (in absolute terms or exceeding specified market benchmarks). It is important to note that hedge funds are typically used only by qualified investors, as hedge funds require fewer SEC regulations than other funds. One aspect that sets the hedge fund industry apart is that they face less regulation than mutual funds and other investment vehicles.

Each hedge fund is built to take advantage of certain identifiable market opportunities. Hedge funds use different investment strategies, so they are usually classified according to investment style. There are large differences in risk attributes and investments between styles.

Legally, hedge funds are usually established as private investment limited partnerships, open to a limited number of qualified investors, and require a large initial minimum investment. Hedge funds' investments are illiquid because they usually require investors to keep their funds in the fund for at least one year, a period called the lock-in period. Withdrawals may also occur only at regular intervals, such as quarterly or every two years (Chen, 2019).

4.1.1 The History of the Hedge Funds

A former writer and sociologist Alfred Winslow Jones's company, A.W. Jones & Co. launched the first hedge fund in 1949. It was while writing an article about current investment trends for Fortune in 1948 that Jones was inspired to try his hand at managing money. He raised $100,000 (including $40,000 out of his own pocket) and set forth to try to minimize the risk in holding long-term stock positions by short selling other stocks. This investing innovation is now referred to as the classic long/short equities model. Jones also employed leverage to enhance returns.

In 1952, Jones altered the structure of his investment vehicle, converting it from a general partnership to a limited partnership and adding a 20% incentive fee as compensation for the managing partner. As the first money manager to combine short selling, the use of leverage shared risk through a partnership with other investors and a compensation system based on investment performance, Jones earned his place in investing history as the father of the hedge fund.

Hedge funds went on to dramatically outperform most mutual funds in the 1960s and gained further popularity when a 1966 article in Fortune highlighted an obscure investment that outperformed every mutual fund on the market by double-digit figures over the previous year and by high double-digits over the previous five years.

However, as hedge fund trends evolved, to maximize returns. many funds turned away from Jones' strategy, which focused on stock picking coupled with hedging and chose instead to engage in riskier strategies based on long-term leverage. These tactics led to heavy losses in 1969-70, followed by a few hedge funds closures during the bear market of 1973-1974.

The industry was relatively quiet for more than two decades until a 1986 article in Institutional Investor touted the double-digit performance of Julian Robertson's Tiger Fund. With a high-flying hedge fund once again capturing the public's attention with its stellar performance, investors flocked to an industry that now offered thousands of funds and an ever-

increasing array of exotic strategies, including currency trading and derivatives such as futures and options.

High-profile money managers deserted the traditional mutual fund industry in droves in the early 1990s, seeking fame and fortune as hedge fund managers. Unfortunately, history repeated itself in the late 1990s and into the early 2000s as a few high-profile hedge funds, including Robertson's, failed in spectacular fashion. Since that era, the hedge fund industry has grown substantially. Today the hedge fund industry is massive—total assets under management in the industry are valued at more than $3.2 trillion according to the 2018 Preying Global Hedge Fund Report. Based on statistics from research firm Barclays hedge, the total number of assets under management for hedge funds jumped by 2335% between 1997 and 2018.

The number of operating hedge funds has grown as well. There were around 2,000 hedge funds in 2002. Estimates vary about the number of hedge funds operating today. This number had crossed 10,000 by the end of 2015. However, losses and underperformance led to liquidations. By the end of 2017, there are 9754 hedge funds according to research firm Hedge Fund Research (Chen, 2019).

4.1.2 Key Characteristics of Hedge Funds

a) Hedge funds are only open to "accredited" or qualified investors

Hedge funds are only allowed to take money from "qualified" investors—individuals with an annual income that exceeds $200,000 for the past two years or a net worth exceeding $1 million, excluding their primary residence. As such, the Securities and Exchange Commission deems qualified investors suitable enough to handle the potential risks that come from a wider investment mandate.

b) They offer wider investment latitude than other funds

A hedge fund's investment universe is only limited by its mandate. A hedge fund can basically invest in anything—land, real estate, stocks, derivatives, and currencies. Mutual funds, by contrast, must basically stick to stocks or bonds and are usually long-only.

c) They often employ leverage

Hedge funds will often use borrowed money to amplify their returns. As we saw during the financial crisis of 2008, leverage can also wipe out hedge funds.

d) Fee structure

Instead of charging an expense ratio only, hedge funds charge both an expense ratio and a performance fee. This fee structure is known as "Two and Twenty"—a 2% asset management fee and then a 20% cut of any gains generated.

4.2 Hedge Fund Distinctions

In order to pursue high returns and low risks, hedge funds must exhibit unique characteristics in the process of participating in investment. Hedge funds have their own unique investment concepts, which distinguish them from other investment instruments. The previous section described hedge funds Development history and basic characteristics, and in this part, we want to focus on elaborating some characteristics of hedge funds that are different from other investment products. And because we studied the process of financial product investment and related features in the front, we will focus on the relevant characteristics of hedge funds with these points.

4.2.1 Investment Strategies

Traditional investment advisors are limited in their investment options, whereas alternative investment advisors are opportunistic. Alternative investment managers can take larger position sizes, invest across asset classes and security types, and employ strategies whose returns generally come from the exploitation of market inefficiencies, not market movements.

Alternative investment strategies are also dynamic by nature. Fund managers can use leverage and sell securities short to vary market exposure actively. Alternative investment returns are therefore a product of how the manager invests, not just where the manager invests.

4.2.2 Return Objectives

The concept of absolute versus relative returns is central to the alternative investment sector. Unlike traditional investment managers driven by index weightings, nontraditional managers invest for absolute returns, not returns relative to the broad market. Most of the returns from alternative investment strategies come from the skill of the manager rather than the returns of an asset class.

4.2.3 Minimum Investment Requirements

For the most part, due to the limited number of clients who can be invested in a fund, the minimum investments steadily increase as the years go by. A manager's initial minimum may be as low as $250,000 or $500,000 but can quickly increase by a multiple. There is no shortage of tier 1 investment managers who have minimum requirements in excess of $10 million. As institutions play an increasing role in the alternative investment arena, fund managers often are induced to take on as client's institutions rather than private individuals who, in most cases, allocate substantially smaller amounts.

4.2.4 Co-investment Opportunities

Hedge fund managers tend to invest a significant portion of their own capital in their partnerships, thereby reinforcing their commitment to their fund's performance. This aspect differs greatly from the world of traditional investment advisors where, for regulatory reasons, managers often are discouraged from purchasing their own proprietary product.

4.2.5 Liquidity

Unlike managed accounts or mutual funds, alternative investment vehicles may typically require a lock-up of 12 months before withdrawals are permitted. Some offshore funds offer liquidity as frequently as weekly, but certain onshore long-term investment pools may require commitments of up to 4 years. It is important to make sure that the fund's liquidity constraints are in keeping with industry norms for the strategy employed.

4.2.6 Access and Transparency

The limited partnership format provides the manager with flexibility to deliver returns that would not be possible through other formats, but it also obscures a client's ability to monitor investment activities. Furthermore, many managers are hesitant to allow clients to second-guess their judgment in short-term increments. Without special considerations, it can be exceedingly difficult to monitor whether a manager is diverging from the stated strategy, inappropriately using derivatives or leverage, or engaging in other unacceptable behavior. Beyond the formal characteristics of what defines a hedge fund, how do hedge funds actually attempt to pursue their investment objectives? Although there are several competing ways to classify and name the many hedge fund styles and strategies, three broad categories should be useful for introductory purposes: (1) directional, (2) nondirectional, and (3) event-driven/opportunistic (Hedges IV, 2005).

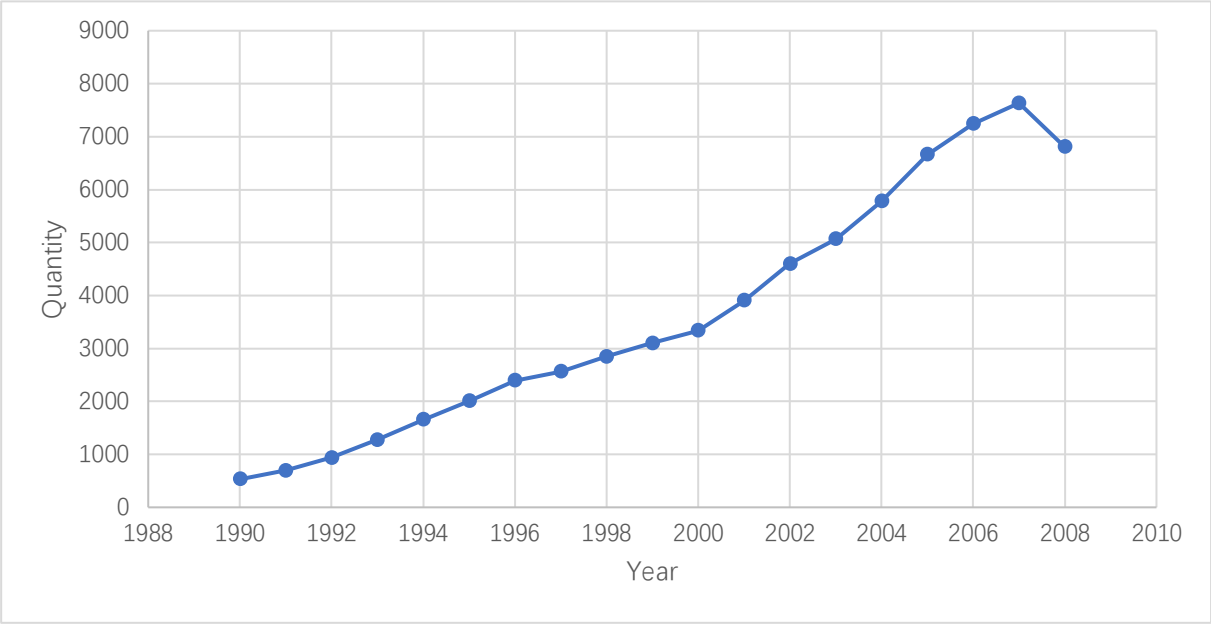
4.3 The Development of Hedge Fund Market

The development of hedge funds has not been a long time, but the stable returns it brings have continued to attract talented investors, so the development of hedge funds is also rapid, and this fact can be further confirmed by some actual data.

4.3.1 The Number of Hedge Fund Companies

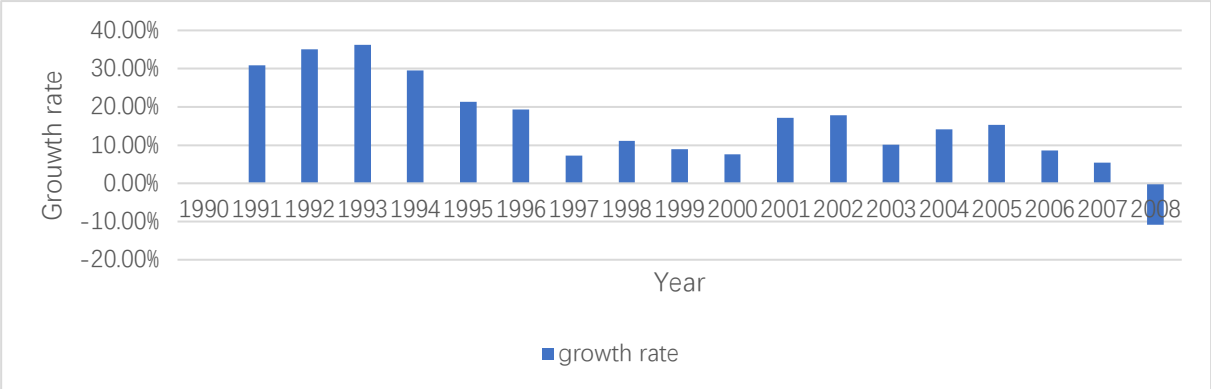
In order to explain the development of hedge funds, the change in the number of companies with hedge funds as their main business can be reflected to a certain extent (Figure 4.1). It can be seen that since 1990, the number of companies with hedge funds as their main business has been increasing. The growth rate gradually stabilized, reflecting the momentum of stable development (Figure 4.2). But we cannot ignore the slight decrease in 2008. As we all know, in 2008, the global financial crisis caused by the US subprime debt crisis, and hedge funds, as a financial product, also suffered. However, the probability of such a global financial crisis is relatively low, so it does not affect its constantly developing perspective.

Figure 4.1. The Quantity of Hedge Funds



Source: Stowell (2010); author

Figure 4.2. Growth Rate



Source: Author's calculation.

Table 4.1 The Quantity of Hedge Funds

Year	Total Quantity	Increased Quantity
1991	694	164
1992	937	243
1993	1277	340
1994	1654	377
1995	2006	352
1996	2392	386
1997	2564	172
1998	2848	284
1999	3102	254
2000	3335	233
2001	3904	569
2002	4598	694
2003	5065	467
2004	5782	717
2005	6665	883
2006	7241	576
2007	7634	393
2008	6808	-826

Source: Author's calculation

Since this section details the growth of the quantity of hedge funds, the actual quantity of changes can better reflect the change in the quantity of hedge fund companies. And we can use the formula to calculate the average amount of growth, which more intuitively reflects the growth of hedge funds during this period. Therefore, it can be obtained by formula 2.4: Arithmetic mean is 349 per year. This is a positive number, which is enough to show that hedge funds have been developing and growing during this time, and they are still a growing financial product.

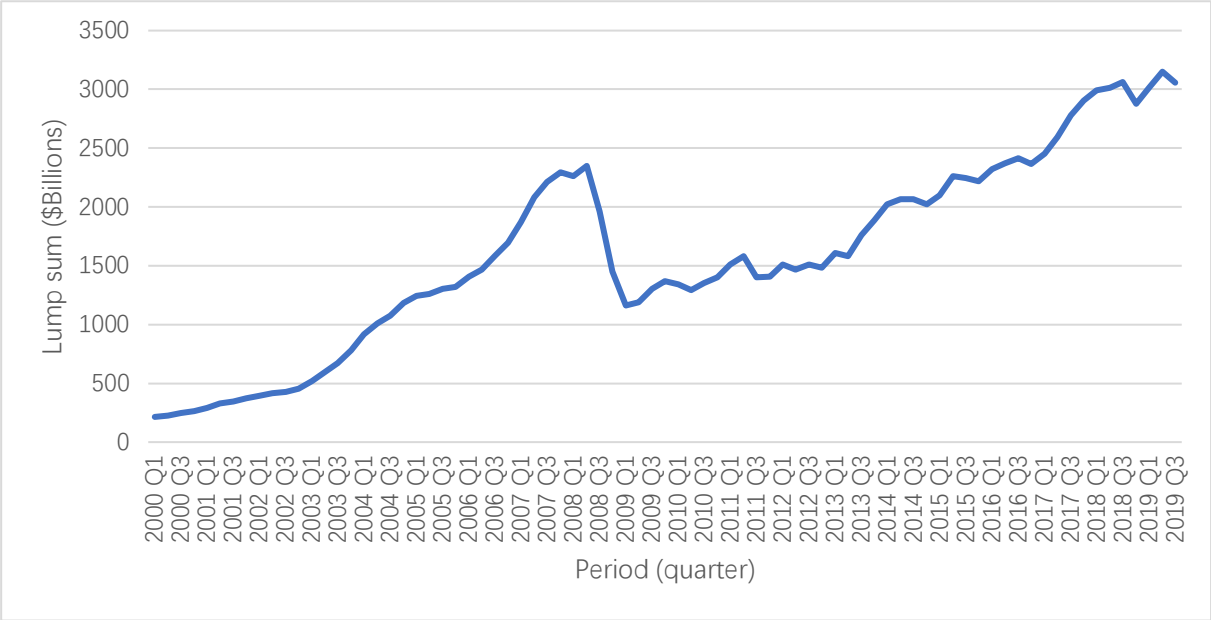
Because some related data of hedge funds are difficult to query, the information queried was published a few years ago. So, when we study the number of hedge fund companies, we can only use the above data. Although this data is ten years earlier than the subsequent data, it can be used as a guide. Through the above calculations, we can get the data we need. When we studied investment analysis methods, we also studied several important premises of technical analysis. History will repeat itself, so historical data is also meaningful for our subsequent development. And this average growth rate is derived from the data of the past eighteen years, so it helps us to draw the final conclusion.

4.3.2 The Assets of the Hedge Fund

A fund is a project where investors' money is gathered to form a collective investment. In other words, the actual investment range of the fund is also very wide, and an important criterion for measuring the fund is the amount of its assets. Based on the information we have obtained the changes in the total assets of the hedge fund since 2000 (Figure 4.3), at the same time, it also shows the change of its growth rate (Figure 4.4). Combining the two graphs, it can be concluded that since 2000, excluding the impact of the global economic crisis in 2008, the growth of hedge funds has been stable. At the same time, it can be known that the total assets of hedge funds have reached historical highs and continued to grow trend. Without the emergence of a global economic crisis similar to 2008, the development prospects of hedge

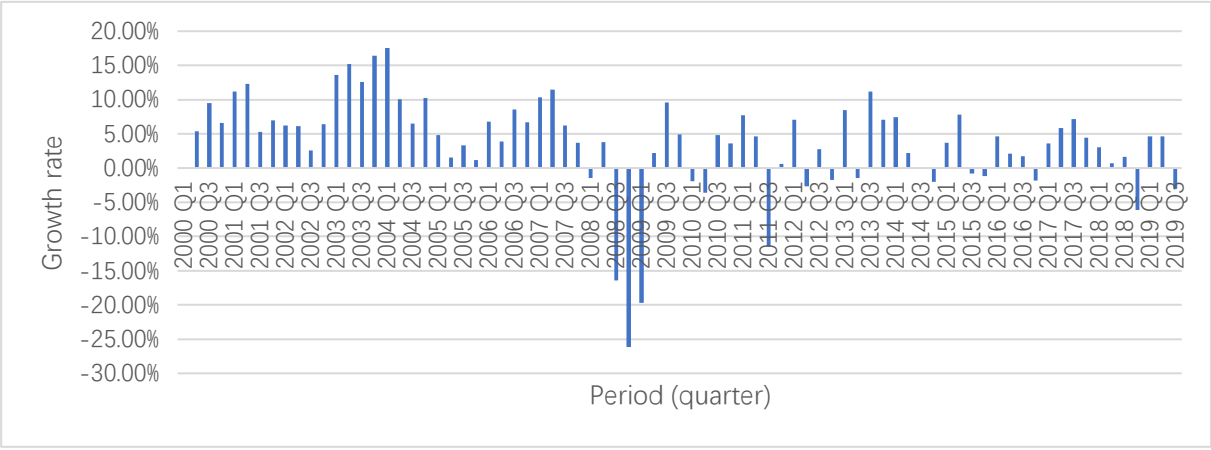
funds can also be expected. At the same time, the specific total assets of hedge funds every quarter can be seen in Annex 1.

Figure 4.3. Number of Assets



Source: Hedge fund research. Inc; author

Figure 4.4. Growth Rate



Source: Author's calculation.

4.4 HFRX of Selected Countries and Regions

In various fields of finance, the index is an important indicator reflecting the product situation in this field. So, when studying hedge funds, there are also relevant indexes. Therefore, we use the index of hedge funds as the main reference object. After we have selected the relevant targets, we will compare the development of hedge funds in different countries and fields. In this section, we mainly collect hedge fund indexes of various countries or regions, and then calculate the results that can help us draw conclusions through relevant formulas.

Through the data on the relevant websites, we can get the monthly returns of various countries and regions. However, it is difficult to draw effective conclusions by directly comparing this data. Therefore, in order to better compare the development of hedge funds in various countries and regions, we calculate the cumulative rate of return by a product of monthly rates of return in excel to get the corresponding results, so as to make the following curve and results.

In today's world, all countries and regions are divided into developed countries and regions and developing countries and regions according to economic development. Since we want to study the development of hedge funds in different countries and regions, it is necessary to divide countries and regions into developed countries and regions and developing countries and regions, and then study the development of hedge funds separately, so as to facilitate We find the factors that affect the development of hedge funds. The specific data used in this chapter can be obtained from Annex 2. The specific growth rate of each country and region can be queried in Annex 3

4.4.1 Some Developed Countries or Regions

In the world's economic and trade, developed countries and regions have always been in a dominant position. Therefore, financial derivatives similar to hedge funds will first emerge and

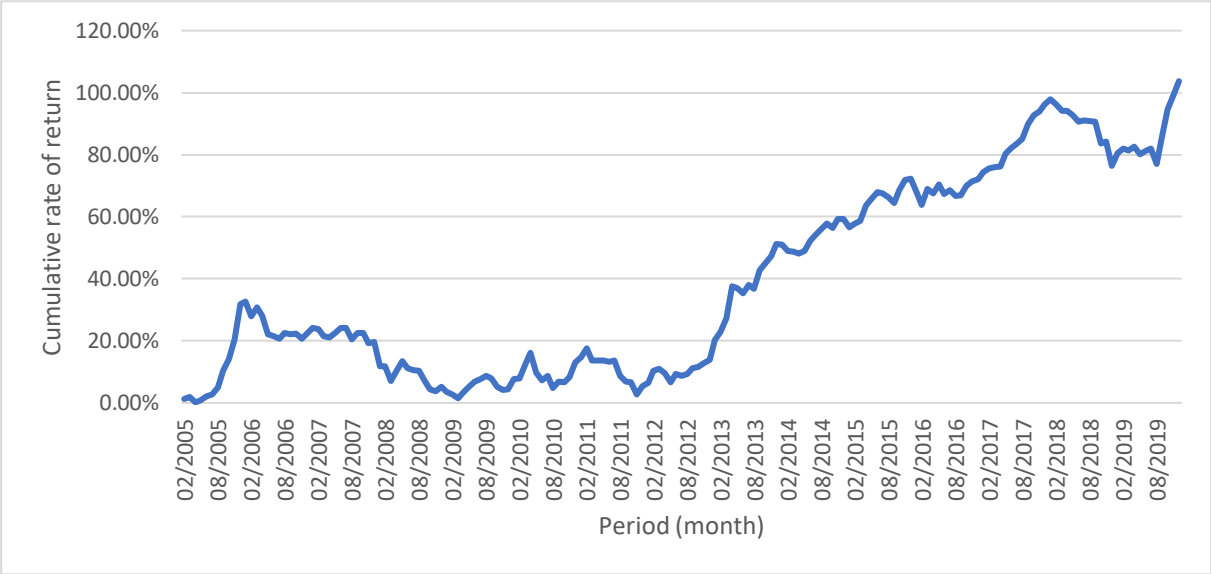
develop in developed countries and regions. Therefore, we need to find several representative developed countries and regions, find the relevant index of hedge funds in the local area, and explore the development of hedge funds through relevant calculations.

At the same time, we calculated the monthly growth rate of funds invested in hedge funds by these countries and regions through Formula 2.5. The geometric average used in Formula 2.5 is suitable for calculations similar to the growth rate, which makes the data obtained more reasonable and comparable. Therefore, the same formula will be used in subsequent calculations to facilitate the comparison of the growth rates of hedge fund indexes in different countries and regions, and to draw our conclusion.

a) Japan

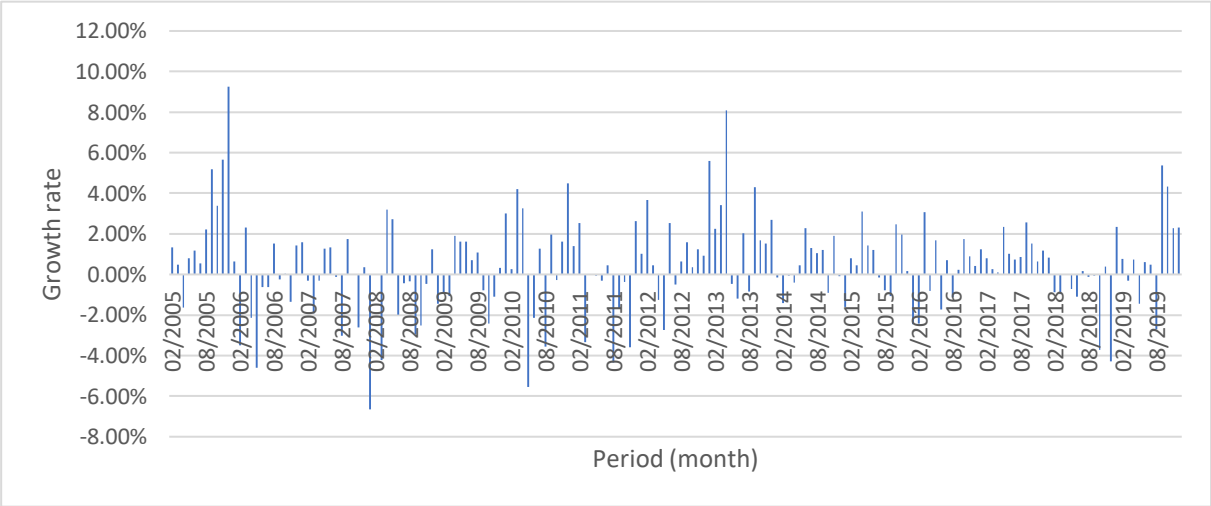
Japan is the largest developed country in Asia, and at the same time it has a pivotal position in the world economy. Therefore, when studying the development of financial products, the development in Japan can more fully represent its development in Asian developed countries. Based on the data found, the development of Japanese hedge funds since 2004 can be derive, and the graph shows that the growth trend is increasing (Figure 4.5). The data comes from the website of a company specializing in hedge funds: Hedge fund research. Inc. Through its unique algorithm, the funds acting on hedge funds in the region are calculated. According to Figure 4.5, we can roughly know the changes in Japan's funds that have acted on hedge funds in the past 15 years. From the final result, we can see that the increase has reached nearly 100%. It can be concluded that the growth of hedge funds in Japan over the years. However, because the annual growth rate is different, sometimes even negative growth will occur (Figure 4.6). Therefore, in order to better compare the hedge funds of various countries and regions, we have to refer to the above Formula 2.5. Using this formula, we can calculate the average monthly growth rate of hedge funds in Japan: **Geometric Mean Return = 0.398%**. Therefore, we conclude that during these 15 years, funds invested in hedge funds in Japan have grown at an average rate of 0.398% per month.

Figure 4.5. Growth of HFRX Japan Index



Source: Author's Calculation

Figure 4.6. Monthly Growth Rate of Return in Japan



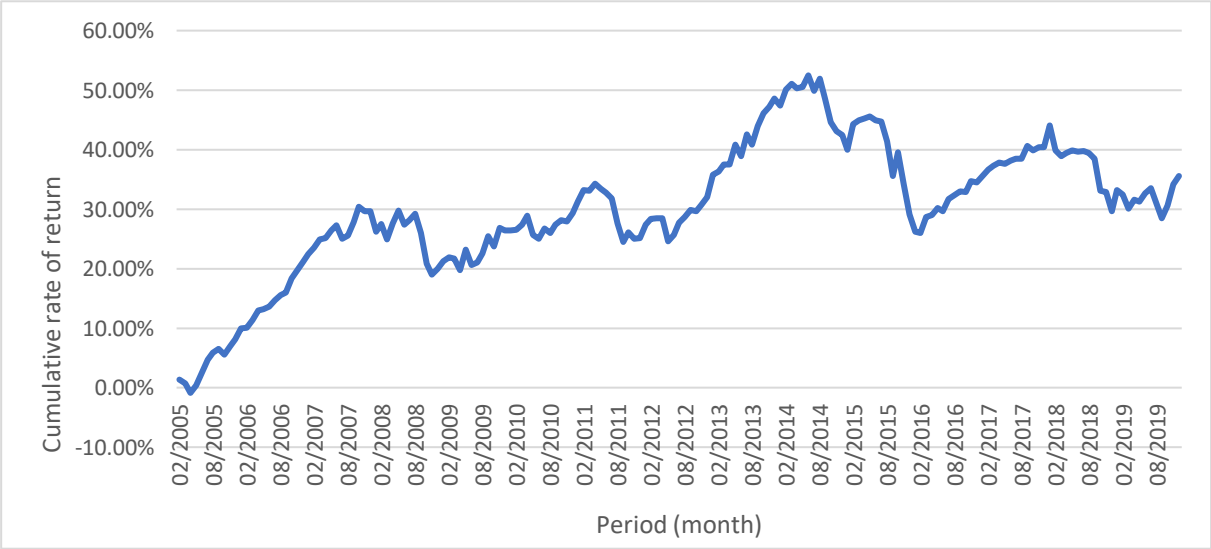
Source: Hedge fund research. Inc; author

b) North America

The main countries in North America are the United States and Canada, which have huge international influences in terms of economy. And there are many excellent hedge fund

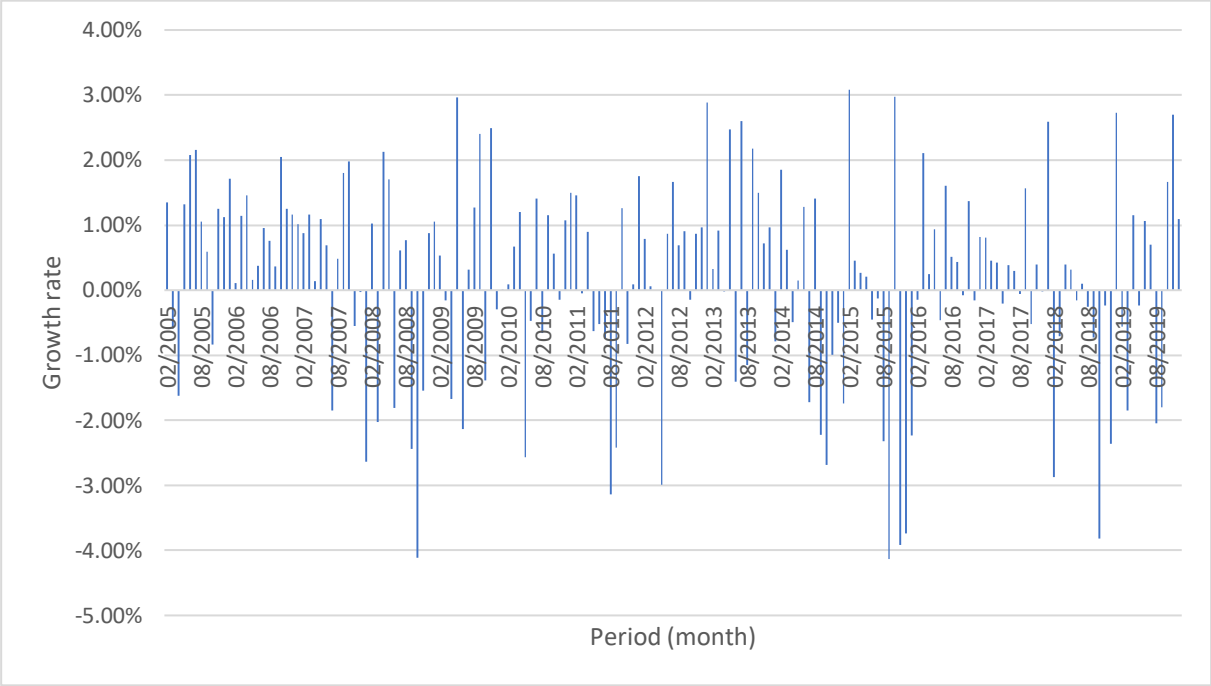
companies in the United States, such as the well-known Buffett 's Berkshire Hathaway specializing in insurance-related financial products, and the resulting hedge fund is also an important part of its business. At the same time, the world 's largest hedge fund company Bridgewater Fund Also from the US. It can be seen from Figure 4.7 that the development of hedge funds in North America is not stable. It developed rapidly in the early 15 years, but gradually became weak in the later period, and even caused a negative growth. In the end, the total investment in hedge funds in North America in the past 15 years has only increased by about 35%. At the same time, we can see from Figure 4.8 that the monthly growth rate of hedge funds in North America is also constantly fluctuating, so we use Formula 2.5 to calculate the average monthly growth rate: **Geometric Mean Return = 0.170%**. So, we can conclude that funds invested in hedge funds in North America are increasing at a rate of 0.170% per month.

Figure 4.7. Growth of HFRX North America Index



Source: Author's calculation.

Figure 4.8. Monthly Growth Rate of Return in North America



Source: Hedge fund research. Inc; author

According to the above research, it can be seen that hedge funds are growing in these developed countries and regions, but the growth rate is not fast, and the growth rate will continue to decline from the graph. Because the economic concepts of people in developed countries and regions are relatively strong, and the financial system in society is relatively complete and mature, hedge funds have developed earlier in these places and the growth rate has slowed in recent years.

4.4.2 Some Developing Countries

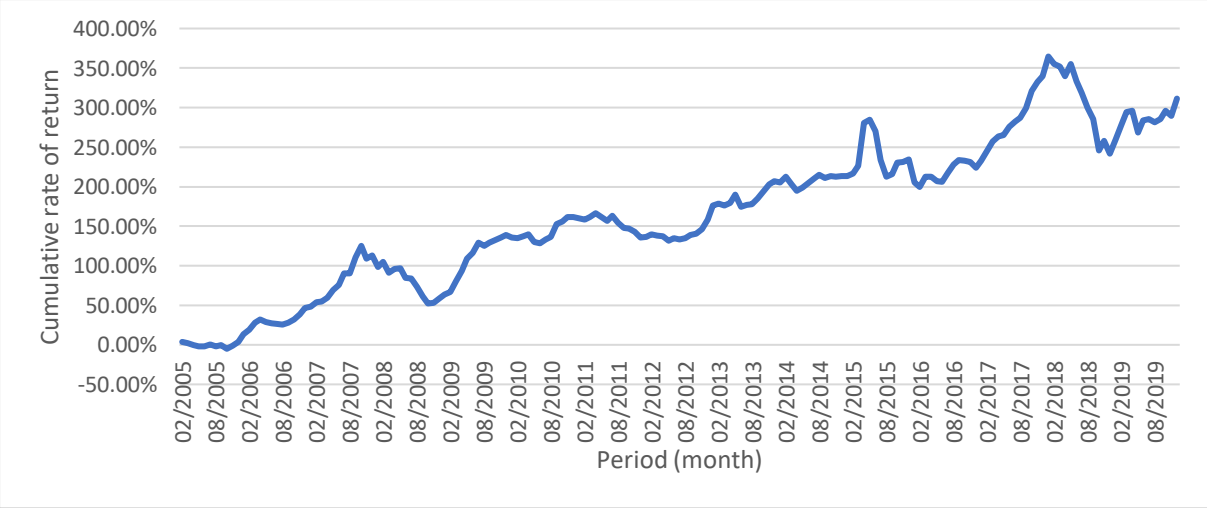
The number of developing countries and regions in the world is greater than that of developed countries and regions, and the distribution is wider. At the same time, developing countries and regions also play an important role in international financial trade and other fields. In addition, the development of some financial products in these developing countries and

regions is much lower than that in developed countries and regions. Therefore, with the rapid development of their own economies, related financial products in these developing countries and regions will also have faster development.

a) China

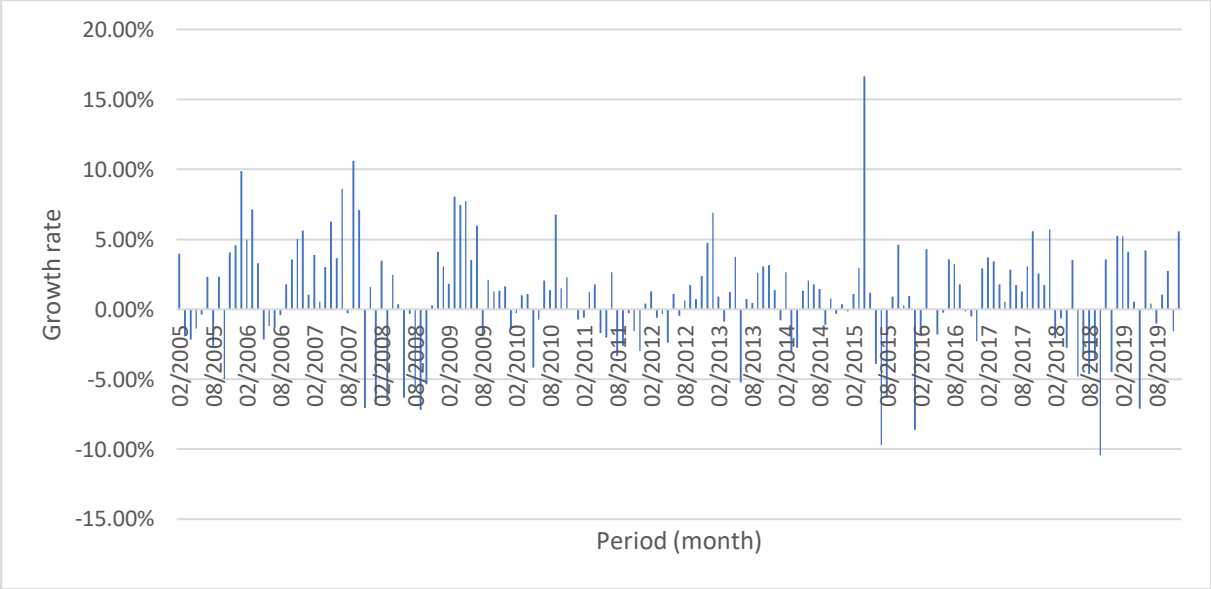
China is the most populous country in the world, and its total GDP is the second largest in the world, so it cannot be ignored when studying the development of hedge funds in developing countries. According to the statistics of the relevant websites through the Internet, the following chart can be drawn. It is not difficult to see from Figure 4.9 that the investment in hedge funds in China has grown rapidly. In the past 15 years, the total amount of hedge funds in China has increased by nearly 300%. Although the overall growth is very large, it can be seen from Figure 4.10 that its monthly growth rate will still fluctuate, and there is also a negative growth situation. So, in order to better compare with other countries and regions, we again use Formula 2.5 to calculate average monthly growth rate of hedge funds in China: **Geometric Mean return (GM) = 0.793%**. Therefore, we conclude that the average monthly growth rate of hedge funds in China is 0.793%.

Figure 4.9. Growth of HFRX China Index



Source: Author's calculation.

Figure 4.10. Monthly Growth Rate of Return in China

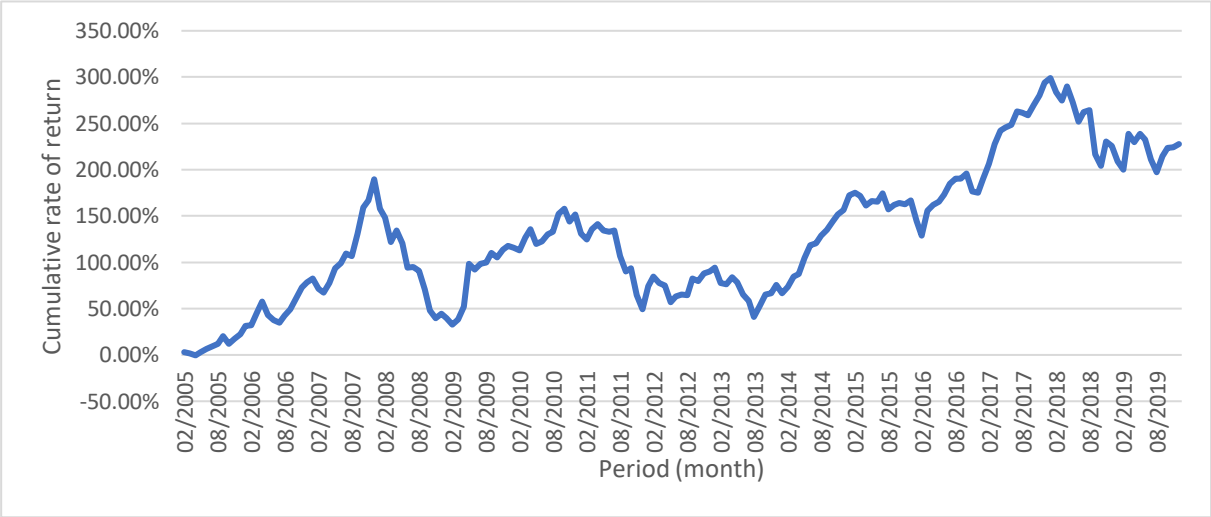


Source: Hedge fund research. Inc; author

b) India

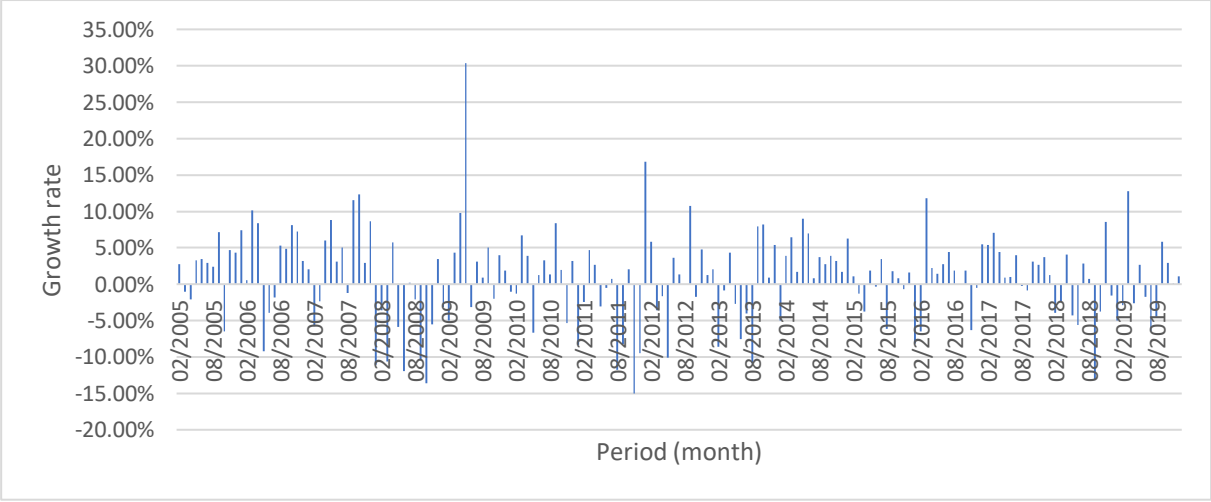
After introducing the development of hedge funds in China, it is not enough to show the development of hedge funds in developing countries. After all, there are the largest number of developing countries in the world, so it is necessary to find relevant data about another important developing country here. India is the second most populous country in the world. Although its total GDP and other indicators are slightly lower than that of China, India plays its own important role in the international social economic trade. Therefore, we obtained the relevant data on the development of hedge funds in India through the same method. It can be seen from Figure 4.11 that hedge funds are also being valued in India. Although there have been twists and turns in these 15 years, they have a growth rate of nearly 225%. It can be seen from Figure 4.12 that the monthly growth rate of hedge funds in India is not stable, so in order to better compare with other countries and regions, we use Formula 2.5 to obtain the average monthly growth rate of hedge funds in India: **Geometric Mean Return = 0.655%**. So, in the end we conclude that the average monthly growth rate of hedge funds in India is 0.655%

Figure 4.11. Growth of HFRX India Index



Source: Author's calculation.

Figure 4.12. Monthly Growth Rate of Return in India



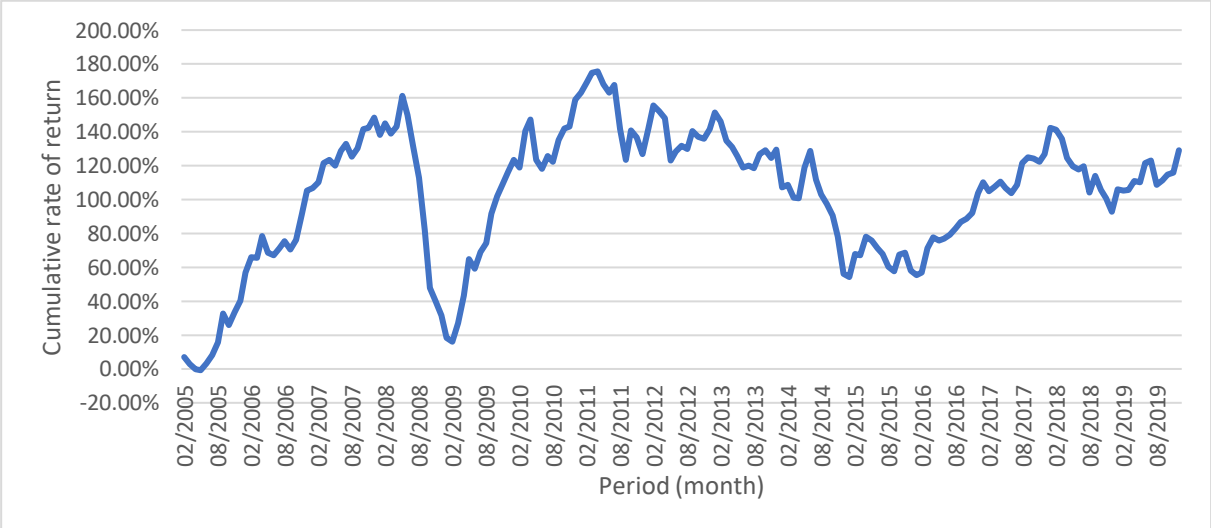
Source: Hedge fund research. Inc; author

c) Russia

As a country from the disintegration of the former world power Soviet Union, it inherited most of the legacy of the Soviet Union, so it is also an integral part of the world economy. At

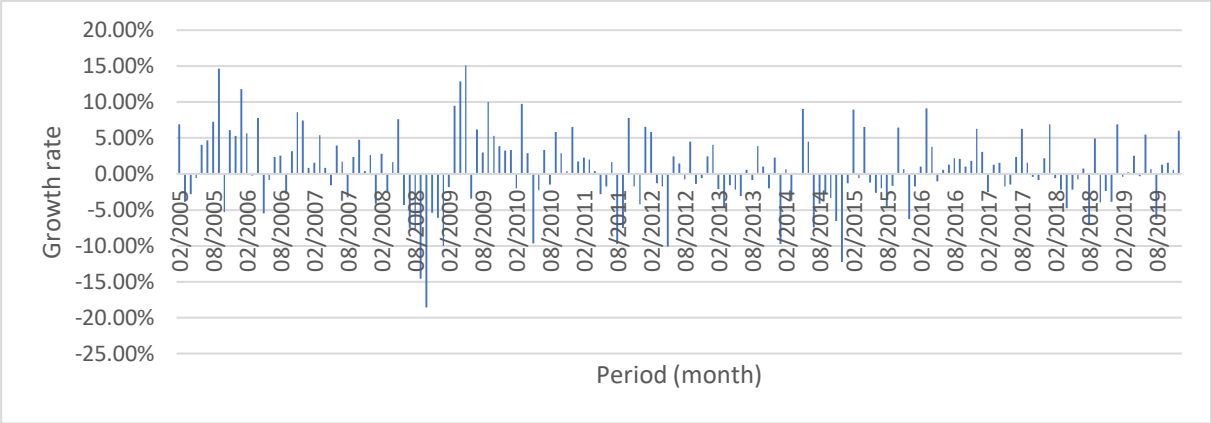
the same time, due to Russia's unique world status, it is also a relatively representative country among developing countries. Russia is also a European country, and its vast territory is destined for Russia to have an important identity in all fields of international finance. Therefore, the development of hedge funds in developing countries should not be ignored for their development in Russia. Through the same channels as above, we obtained data on hedge funds in Russia over the years and obtained the following graphs (Figure 4.13). It can be seen from the graph that in the past 15 years, hedge funds have developed rapidly in the early days of Russia, but they have continued to fluctuate in the medium to late stages. However, in the end, the investment of hedge funds in Russia has also increased by nearly 120%. In order to further compare the development of hedge funds in countries and regions, we collected the monthly growth rate of hedge funds in Russia. As can be seen from Figure 4.14, the monthly growth rate will also be quite different. So, we again calculated the monthly average growth rate of hedge funds in Russia through Figure 2.5: **Geometric Mean Return = 0.464%**. In the end, we conclude that the average monthly growth rate of hedge funds in Russia is 0.464%.

Figure 4.13. Growth of HFRX Russia Index



Source: Author's calculation

Figure 4.14. Monthly Growth Rate of Return in Russia



Source: Hedge fund research. Inc; author

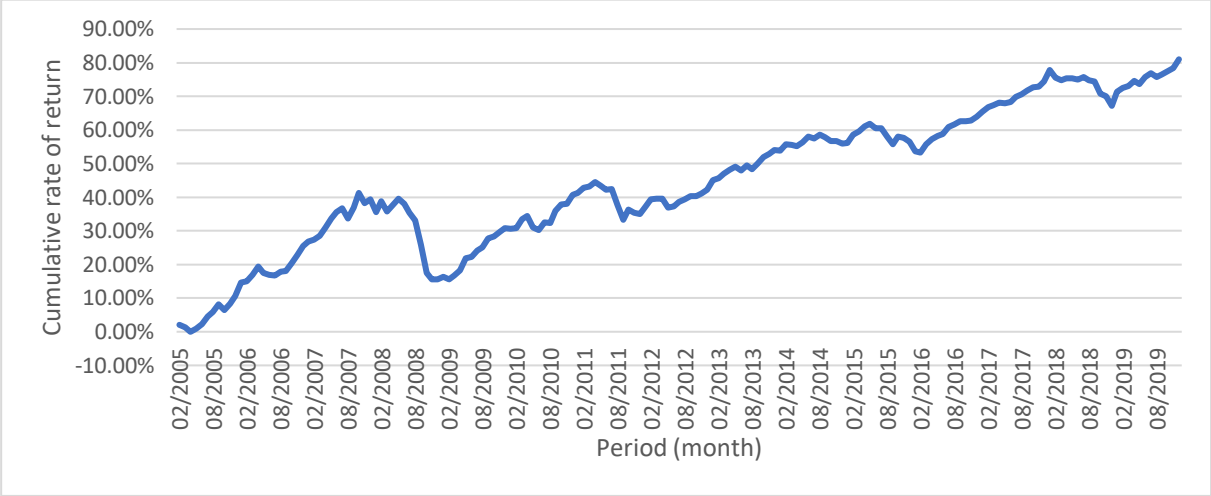
According to the development of hedge funds in the above three developing countries, although the average development rate is not very fast, it can be known that hedge funds are constantly developing. And compared with the growth rate of developed countries and regions, it can be found that it is much higher than them. It can be seen from this that hedge funds still have great potential for development in developing countries.

4.4.3 Development of Aggregate Index

In order to better compare the development of hedge funds in different countries and regions, an overall data is introduced, and the overall development of hedge funds based on data on relevant websites. First of all, it can be drawn from Figure 4.15 that in the past 15 years, the funds invested in hedge funds have been growing, and the volume of hedge funds has also been rising. Then, in order to be able to compare with the monthly average growth rate of each country and region calculated above, we calculate the overall monthly average growth rate of the hedge fund through Formula 2.5: **Geometric Mean Return = 0.332%**. Then comparing with the data obtained above, it can be concluded that the growth rate of hedge funds in developing countries is much faster than the overall growth rate of hedge funds, while in

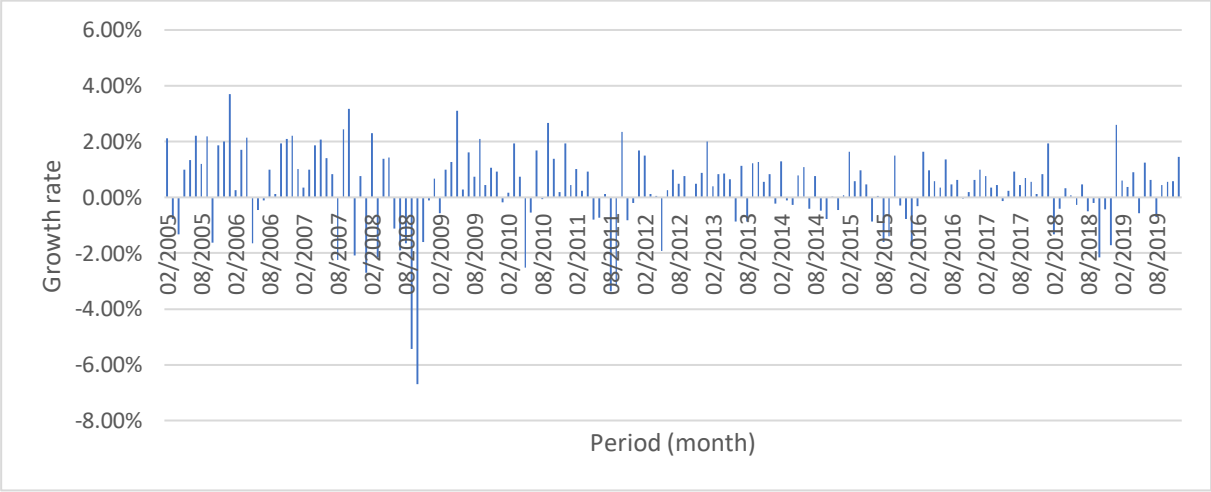
developed countries and regions, the speed of hedge funds is similar to or even lower The average growth rate of hedge funds. Without considering the size of the hedge fund itself, it is not difficult to conclude from this that the development of hedge funds in developing countries is better than that of hedge funds in developed countries and regions.

Figure 4.15. Growth of HFRX Aggregate Index



Source: Author's calculation.

Figure 4.16. Monthly Rate of Return



Source: Hedge fund research. Inc; author

4.5 The Prospect of Hedge Fund Market

Hedge fund is a typical collective investment product, but it pays more attention to income than other collective investment products. According to the above research, it is not difficult to find that hedge funds are gradually recognized by the majority of investors, and funds are invested in this product. In the capital market, capital is always the basis for investment.

On the other hand, we must admit that in the capital market, it is often a small number of people who can obtain income. So, when more and more investors follow the same philosophy to invest, this philosophy will not be as effective as it used to be. Therefore, hedge funds must also continue to evolve and grow, and their ideas must be continuously updated according to the changes in investors' ideas in order to continue to maintain their expected investment goals.

When we participate in the financial market as an investor, we must clarify what was emphasized at the beginning of the thesis, and there must be risks in investment. This is something that investors must recognize and value. From the data collected above, it is not difficult to see that the overall development of hedge funds is also declining in the face of a worldwide financial crisis, which also reflects the risks that have always existed in the financial market.

Of course, most of the time, hedge funds can bring stable and better returns to investors. Because the hedge fund itself mainly invests according to some laws in the financial market. So, when the financial market is operating normally, the financial market will follow these general laws, and some financial products in the financial market will have opposite reactions to the same information, and hedge funds can make good use of this. Pursue high returns while ensuring low risk.

Therefore, in the current financial market, hedge funds have gradually become a financial product recognized and invested by the majority of investors. Of course, because financial products are affected by national and regional policies, humanities, and economic factors, they will have different developments in different countries and regions. In the above research, we

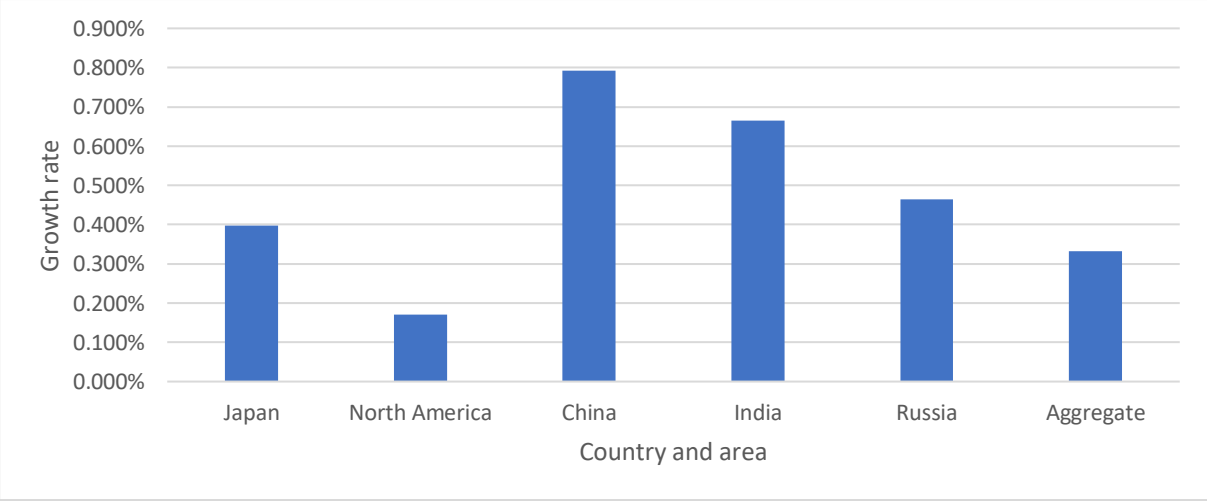
studied the overall development of hedge funds in several representative countries and regions and concluded that hedge funds can have certain development in different countries and regions. Therefore, in order to further study the development of hedge funds, we must put together the above-mentioned calculated data for comparison (Table 4.2). According to Figure 4.17, it can be clearly seen that the growth rate of hedge funds in developing countries exceeds the overall average growth rate, and the overall development rate in developed countries and regions is close to or lower than the overall average growth rate. Based on the facts derived from this data, we can further explore the reasons for this result.

Table 4.2. Average Growth Rate of Different Countries and Regions

	Country and Area	GMR
Developed Countries and Area	Japan	0.398%
	North America	0.170%
Developing Countries	China	0.793%
	India	0.665%
	Russia	0.464%
Development of Aggregate Index	Aggregate	0.332%

Source: Author's calculation

Figure 4.17. Average Growth Rate of Different Countries and Areas



Source: Author's calculation

5 Conclusion

In the capital market, the power of individual investors is often insufficient. Funding and expertise are the keys that make it difficult for many ordinary investors to profit from the capital market. Therefore, the investment form of collective investment has emerged, and it can be solved this problem very well. In collective investment, there will also be products with different investment concepts and investment targets. Among them, hedge funds are a typical example of investors making collective investments for profit. Through professional financial knowledge, clever use of various financial derivatives in the capital market, based on huge funds, so as to obtain greater returns with lower risks. For the most of investors, hedge funds are powerful and distant, but this article gradually reveals the development and future trends of hedge funds through shallow to deep research, allowing us to come from the perspective of an investment beginner to research this financial product.

Through the elaboration of this thesis, we have reached the final conclusion through a wide range of capital markets, concentration to the hedge fund itself, from various formulas that are widely used to application to actual data. Hedge funds have continued to develop in the past. First, the development of hedge funds is closely related to the region in which they are located. In countries and regions where development is relatively rapid and capital markets are not fully developed, that is, developing countries and regions, hedge funds can have a growth rate that exceeds the overall average growth rate. In countries and regions with relatively complete capital market development, that is, developed countries and regions, the development rate of hedge funds will be close to or lower than the overall average development rate. Second, through the curve in Chapter 4 based on the data of hedge funds in various countries and regions, it can also be concluded that the development of hedge funds and time and scale are also closely related. No matter in which country or region, the development speed of hedge funds is more rapid in the early stage, but as the scale continues to increase, the investment philosophy of hedge funds will be affected. When there are too many people with the same investment

philosophy in the capital market, the returns of hedge funds will be affected. The impact of income will naturally also affect the development of the hedge fund itself. Third, the response of hedge funds to sudden events will be more intense. Through our step-by-step research, it can be concluded that hedge funds mainly use some historical laws in the capital market and previous interactions with multiple financial derivatives. When a major event triggers a financial crisis, certain laws will not appear, and the previous role of certain financial derivatives will also change, which is fatal to hedge funds. Because hedge funds are originally the simultaneous function of a large amount of funds, when such a crisis occurs, the losses caused by large amounts of funds are also huge, which is also a corresponding risk. However, in the long run, the capital market will become more rational, so the balanced thinking of hedge funds will make the fund more rational to where it should go, so the concept of hedge funds is adapted to the development of capital markets. From the graphs and data obtained in Chapter 4, it can be concluded that when hedge funds face a global economic crisis, they will also show a less stable state. However, in the course of economic development, most of the time it still tends to be rational and stable, so hedge funds can get better returns in the general period. Combining the various conclusions drawn, we conclude that under normal circumstances, hedge funds will continue to develop and expand in the future and will develop faster in developing countries and regions. In the event of a worldwide economic crisis, it is difficult for hedge funds to maintain a stable development in general.

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List of Abbreviations

IPOs – Initial Public Offerings

SEC – Securities and Exchange Commission

NYSE – New York Stock Exchange

HNWIs – High Net Worth Individuals

ETFs – Exchange – traded funds

HFRX – Hedge Fund Index

AM – Arithmetic Mean

GM – Geometric Mean

GMR – Geometric Return

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Ostrava dated 02/06/2020

Fengze Zhao 赵逢泽

Student's name and surname

List of Annexes

Annex 1: The total asset of hedge funds

Year	Num of Asset ($ Billions)
2000 Q1	214.34
2000 Q2	225.8
2000 Q3	247.21
2000 Q4	263.46
2001 Q1	292.92
2001 Q2	329.05
2001 Q3	346.32
2001 Q4	370.3
2002 Q1	393.28
2002 Q2	417.53
2002 Q3	428.13
2002 Q4	455.41
2003 Q1	517.57
2003 Q2	596.1
2003 Q3	671.29
2003 Q4	781.39
2004 Q1	918.18
2004 Q2	1010.31
2004 Q3	1075.77
2004 Q4	1185.73
2005 Q1	1242.85
2005 Q2	1262.29
2005 Q3	1304.14
2005 Q4	1319.13
2006 Q1	1409.16
2006 Q2	1464.4
2006 Q3	1589.45
2006 Q4	1695.83
2007 Q1	1870.3
2007 Q2	2084.65
2007 Q3	2214.13
2007 Q4	2295.46
2008 Q1	2263.09
2008 Q2	2348.84
2008 Q3	1963.7
2008 Q4	1449.76
2009 Q1	1164.23

2009 Q2	1189.41
2009 Q3	1303.71
2009 Q4	1367.39
2010 Q1	1341.27
2010 Q2	1292.34
2010 Q3	1354.62
2010 Q4	1402.73
2011 Q1	1510.36
2011 Q2	1580.45
2011 Q3	1399.51
2011 Q4	1408.39
2012 Q1	1507.99
2012 Q2	1467.75
2012 Q3	1508.63
2012 Q4	1481.92
2013 Q1	1606.74
2013 Q2	1582.91
2013 Q3	1760.03
2013 Q4	1883.75
2014 Q1	2023.06
2014 Q2	2067.03
2014 Q3	2066.99
2014 Q4	2024.83
2015 Q1	2099.06
2015 Q2	2263.04
2015 Q3	2244.69
2015 Q4	2219.24
2016 Q1	2322.57
2016 Q2	2371.18
2016 Q3	2412.63
2016 Q4	2367.48
2017 Q1	2451.77
2017 Q2	2594.34
2017 Q3	2780.9
2017 Q4	2905.67
2018 Q1	2993.66
2018 Q2	3014.3
2018 Q3	3064.87
2018 Q4	2878.1

2019 Q1	3011.3
2019 Q2	3150.7
2019 Q3	3054.9

Annex 2: The monthly index value in selected countries and areas

	Japan	North America	China	India	Russia	Aggregate
Date	Monthly Index value					
01/2005	1100.18	1001.74	1014.43	985.65	1014.60	1001.93
02/2005	1114.81	1015.27	1054.63	1012.59	1084.74	1023.06
03/2005	1120.05	1009.33	1034.28	1002.09	1042.15	1015.17
04/2005	1101.68	992.95	1012.20	981.04	1012.43	1001.64
05/2005	1110.38	1006.10	998.17	1012.75	1006.83	1011.67
06/2005	1123.48	1027.05	994.38	1047.84	1047.40	1025.22
07/2005	1129.66	1049.19	1017.41	1078.11	1096.01	1047.98
08/2005	1154.63	1060.30	990.89	1103.80	1175.52	1060.53
09/2005	1214.32	1066.57	1014.04	1182.72	1347.50	1083.76
10/2005	1255.37	1057.62	963.44	1105.92	1276.10	1066.13
11/2005	1326.42	1070.87	1002.50	1157.32	1353.35	1085.91
12/2005	1449.25	1082.90	1048.16	1207.10	1424.72	1107.72
01/2006	1458.38	1101.51	1151.74	1296.73	1592.67	1148.71
02/2006	1407.34	1102.76	1209.30	1303.96	1683.27	1151.58
03/2006	1439.84	1115.34	1295.80	1435.59	1679.59	1171.25
04/2006	1408.89	1131.58	1338.43	1555.43	1809.68	1196.21
05/2006	1343.94	1133.42	1309.66	1411.77	1710.22	1176.57
06/2006	1335.74	1137.71	1294.26	1356.21	1696.17	1171.11
07/2006	1327.46	1148.54	1278.19	1331.68	1736.12	1169.72
08/2006	1347.50	1157.20	1272.99	1402.50	1780.02	1181.20
09/2006	1344.13	1161.38	1295.69	1470.16	1730.50	1182.67
10/2006	1344.81	1185.17	1341.73	1589.89	1785.67	1205.59
11/2006	1326.79	1200.01	1408.96	1704.90	1938.76	1230.89
12/2006	1345.89	1214.01	1488.26	1759.87	2082.20	1258.05
01/2007	1367.02	1226.27	1503.72	1795.44	2099.54	1270.96
02/2007	1362.65	1236.98	1561.80	1691.77	2132.94	1275.35
03/2007	1336.62	1251.33	1570.06	1651.91	2247.93	1288.10
04/2007	1332.34	1253.11	1617.24	1750.90	2267.30	1312.09
05/2007	1349.13	1266.78	1718.15	1905.98	2232.55	1339.36
06/2007	1367.21	1275.56	1780.63	1964.63	2320.82	1358.26
07/2007	1365.71	1251.96	1934.03	2062.96	2360.72	1369.70
08/2007	1324.60	1258.07	1928.73	2038.21	2283.94	1338.88
09/2007	1347.65	1280.70	2133.20	2273.30	2337.45	1371.66
10/2007	1347.38	1306.07	2283.95	2553.38	2448.85	1415.20

11/2007	1312.08	1298.87	2123.08	2627.56	2457.60	1385.65
12/2007	1316.80	1298.46	2157.04	2855.26	2520.91	1396.21
01/2008	1229.23	1264.23	2009.64	2538.73	2416.19	1358.63
02/2008	1228.86	1277.23	2079.30	2446.98	2483.20	1389.93
03/2008	1176.88	1251.32	1942.87	2187.16	2425.20	1360.15
04/2008	1214.42	1277.95	1991.11	2312.31	2464.46	1378.81
05/2008	1247.33	1299.76	1998.26	2176.95	2651.16	1398.43
06/2008	1222.78	1276.29	1872.16	1916.99	2535.34	1382.89
07/2008	1217.32	1284.10	1865.87	1920.67	2343.36	1356.68
08/2008	1213.04	1293.92	1760.59	1879.76	2157.39	1334.26
09/2008	1177.14	1262.35	1633.74	1685.69	1843.23	1261.70
10/2008	1147.63	1210.45	1546.30	1456.09	1501.33	1177.21
11/2008	1142.22	1191.71	1550.60	1376.29	1420.13	1158.39
12/2008	1156.40	1202.12	1614.25	1423.26	1333.52	1157.10
01/2009	1139.84	1214.79	1663.57	1378.85	1199.81	1164.74
02/2009	1129.23	1221.31	1694.02	1309.84	1177.57	1158.04
03/2009	1117.29	1219.44	1830.38	1366.00	1289.18	1169.59
04/2009	1138.40	1199.06	1967.05	1499.87	1454.70	1184.47
05/2009	1156.78	1234.56	2118.68	1955.70	1673.88	1221.35
06/2009	1175.35	1208.19	2193.13	1893.72	1616.29	1224.86
07/2009	1183.55	1212.06	2324.33	1952.19	1715.79	1244.53
08/2009	1196.29	1227.46	2280.15	1969.67	1766.45	1253.72
09/2009	1186.80	1256.91	2327.53	2068.82	1943.91	1280.02
10/2009	1158.09	1239.45	2356.73	2026.57	2047.21	1285.68
11/2009	1145.48	1270.31	2387.78	2107.67	2125.62	1299.32
12/2009	1149.04	1266.58	2427.41	2147.34	2195.26	1311.46
01/2010	1183.48	1266.60	2392.48	2124.41	2267.77	1308.99
02/2010	1186.56	1267.71	2385.78	2097.44	2221.45	1311.13
03/2010	1236.51	1276.24	2409.15	2237.48	2438.38	1336.55
04/2010	1276.99	1291.56	2435.48	2324.89	2509.22	1346.47
05/2010	1206.33	1258.33	2334.45	2169.62	2265.35	1312.47
06/2010	1180.44	1252.42	2317.03	2196.88	2213.75	1305.42
07/2010	1195.33	1270.03	2364.60	2267.88	2287.94	1327.31
08/2010	1152.87	1261.69	2397.15	2297.32	2254.68	1326.55
09/2010	1175.66	1276.26	2559.66	2488.96	2385.24	1361.98
10/2010	1172.34	1283.48	2597.83	2538.54	2455.11	1380.76
11/2010	1191.16	1281.66	2656.73	2402.48	2464.38	1383.42
12/2010	1244.64	1295.43	2654.85	2479.51	2625.66	1410.07
01/2011	1262.09	1314.85	2635.54	2273.28	2670.76	1416.40

02/2011	1294.13	1333.99	2619.78	2217.76	2732.34	1430.74
03/2011	1250.92	1333.40	2652.55	2320.63	2786.28	1434.08
04/2011	1250.59	1345.33	2700.14	2381.34	2796.32	1447.31
05/2011	1249.71	1336.89	2654.22	2308.28	2718.20	1435.89
06/2011	1245.68	1329.87	2600.77	2295.62	2670.41	1425.42
07/2011	1251.22	1319.89	2669.04	2311.57	2714.21	1427.23
08/2011	1196.73	1278.49	2579.18	2039.38	2448.85	1379.19
09/2011	1176.39	1247.54	2511.55	1871.95	2265.30	1335.35
10/2011	1172.14	1263.31	2504.65	1910.68	2442.74	1366.84
11/2011	1130.17	1252.84	2465.65	1624.32	2401.16	1355.65
12/2011	1159.96	1253.95	2392.61	1470.40	2299.29	1352.95
01/2012	1171.75	1275.95	2402.04	1717.85	2449.73	1375.81
02/2012	1214.89	1286.06	2433.10	1817.47	2593.12	1396.53
03/2012	1220.52	1286.77	2417.97	1752.20	2559.78	1398.33
04/2012	1205.27	1286.70	2410.47	1723.74	2516.07	1398.98
05/2012	1172.33	1248.15	2353.03	1549.11	2261.11	1371.97
06/2012	1201.89	1258.94	2378.77	1605.55	2315.75	1375.42
07/2012	1195.82	1279.87	2367.20	1626.72	2350.50	1389.02
08/2012	1203.41	1288.70	2382.65	1625.02	2333.29	1395.85
09/2012	1222.60	1300.43	2423.66	1799.25	2438.41	1406.65
10/2012	1227.00	1298.46	2440.82	1768.50	2404.92	1406.64
11/2012	1242.09	1309.75	2499.20	1853.39	2391.72	1413.41
12/2012	1253.44	1322.44	2618.35	1876.60	2451.15	1425.75
01/2013	1323.61	1360.65	2798.56	1915.53	2550.22	1454.19
02/2013	1353.55	1365.07	2824.35	1751.49	2495.67	1459.88
03/2013	1399.91	1377.57	2799.86	1736.25	2380.01	1472.01
04/2013	1513.20	1377.36	2834.08	1810.81	2342.59	1484.55
05/2013	1506.00	1411.36	2940.33	1761.36	2290.45	1494.19
06/2013	1487.88	1391.47	2786.91	1628.02	2220.78	1481.36
07/2013	1517.89	1427.67	2806.56	1562.52	2233.86	1498.22
08/2013	1505.13	1411.26	2819.60	1392.89	2215.16	1485.21
09/2013	1569.99	1441.94	2893.06	1503.64	2301.56	1503.52
10/2013	1596.16	1463.48	2981.34	1626.77	2324.39	1522.70
11/2013	1620.71	1473.96	3074.91	1640.78	2278.36	1531.33
12/2013	1664.19	1488.22	3117.27	1729.09	2329.77	1544.16
01/2014	1661.68	1476.56	3093.29	1643.30	2103.05	1540.70
02/2014	1638.25	1503.90	3174.48	1707.89	2117.49	1560.51
03/2014	1637.21	1513.27	3075.12	1818.24	2039.34	1558.82
04/2014	1630.68	1505.82	2990.81	1848.90	2036.81	1554.56

05/2014	1638.14	1508.12	3029.93	2015.07	2221.62	1566.91
06/2014	1675.33	1527.41	3092.64	2155.27	2321.18	1583.73
07/2014	1697.23	1501.05	3147.89	2173.69	2148.32	1577.27
08/2014	1714.88	1522.13	3193.06	2253.81	2059.25	1589.24
09/2014	1735.52	1488.28	3157.46	2316.22	2000.67	1581.81
10/2014	1719.88	1448.36	3181.59	2406.29	1934.53	1569.71
11/2014	1752.60	1433.93	3171.71	2482.90	1806.98	1569.97
12/2014	1751.24	1426.69	3183.27	2525.42	1585.67	1562.85
01/2015	1722.91	1401.84	3178.29	2682.63	1565.25	1564.00
02/2015	1736.73	1445.02	3212.31	2711.64	1704.77	1589.47
03/2015	1744.68	1451.57	3308.16	2675.58	1694.42	1598.73
04/2015	1799.02	1455.50	3858.65	2574.21	1805.59	1614.19
05/2015	1824.71	1458.53	3904.86	2622.69	1783.17	1621.54
06/2015	1846.69	1451.90	3752.70	2614.82	1736.70	1607.54
07/2015	1844.00	1450.10	3388.10	2704.99	1702.25	1608.33
08/2015	1829.61	1416.46	3173.70	2538.14	1625.03	1582.58
09/2015	1809.92	1357.85	3203.04	2582.50	1597.69	1560.51
10/2015	1854.83	1398.29	3350.32	2603.44	1700.74	1583.97
11/2015	1891.21	1343.55	3359.72	2586.65	1711.42	1579.45
12/2015	1894.15	1293.27	3391.72	2628.48	1603.83	1567.37
01/2016	1847.67	1264.41	3099.44	2413.54	1575.72	1540.07
02/2016	1803.16	1262.52	3040.73	2256.52	1591.96	1535.27
03/2016	1858.28	1289.08	3171.29	2522.13	1736.85	1560.41
04/2016	1843.07	1292.29	3171.46	2579.18	1802.94	1575.58
05/2016	1873.93	1304.41	3115.26	2615.62	1783.58	1584.81
06/2016	1841.35	1298.41	3108.12	2688.30	1794.33	1590.36
07/2016	1854.27	1319.25	3218.60	2806.82	1816.76	1611.84
08/2016	1833.21	1326.00	3323.54	2860.20	1855.89	1619.27
09/2016	1837.17	1331.75	3382.17	2859.26	1894.00	1629.36
10/2016	1869.18	1330.73	3377.31	2913.42	1912.90	1628.70
11/2016	1885.67	1348.92	3359.43	2728.89	1947.14	1631.92
12/2016	1893.63	1346.79	3282.54	2714.51	2068.78	1642.10
01/2017	1917.11	1357.83	3378.69	2863.45	2132.79	1658.50
02/2017	1932.23	1368.85	3503.13	3018.01	2078.89	1671.28
03/2017	1937.02	1375.06	3623.14	3231.51	2104.68	1677.16
04/2017	1938.98	1380.94	3687.91	3373.75	2136.47	1684.40
05/2017	1984.28	1378.08	3707.56	3404.08	2098.88	1682.33
06/2017	2004.65	1383.39	3812.97	3437.11	2067.30	1686.24
07/2017	2019.05	1387.45	3879.16	3574.94	2115.41	1702.01

08/2017	2036.47	1386.60	3928.49	3566.57	2248.77	1709.55
09/2017	2088.88	1408.38	4049.28	3536.79	2282.66	1721.26
10/2017	2120.39	1401.02	4275.13	3647.22	2272.84	1730.84
11/2017	2134.01	1406.56	4383.49	3744.78	2253.19	1733.05
12/2017	2158.78	1406.36	4459.17	3884.01	2301.68	1747.59
01/2018	2176.79	1442.75	4713.13	3932.78	2459.50	1781.41
02/2018	2157.93	1401.30	4616.67	3779.66	2446.12	1758.00
03/2018	2136.73	1391.39	4586.15	3689.95	2393.32	1750.66
04/2018	2136.09	1396.82	4460.62	3840.99	2278.17	1756.29
05/2018	2120.79	1401.21	4617.93	3674.97	2228.57	1757.50
06/2018	2097.54	1399.04	4394.79	3469.52	2210.76	1752.69
07/2018	2101.27	1400.45	4250.95	3568.96	2228.13	1760.72
08/2018	2098.52	1396.84	4054.81	3593.54	2069.47	1751.78
09/2018	2097.37	1386.69	3914.18	3119.00	2170.99	1748.31
10/2018	2019.36	1333.74	3505.90	3000.39	2085.21	1710.88
11/2018	2027.23	1330.65	3629.99	3257.01	2036.50	1703.36
12/2018	1940.36	1299.23	3467.78	3206.96	1956.68	1674.20
01/2019	1986.07	1334.69	3650.34	3045.94	2091.71	1717.68
02/2019	2001.08	1327.21	3839.95	2958.68	2082.22	1727.96
03/2019	1994.85	1302.62	3997.95	3336.02	2085.97	1734.23
04/2019	2009.73	1317.67	4018.97	3249.59	2138.20	1749.80
05/2019	1980.41	1314.57	3734.08	3336.72	2130.80	1739.77
06/2019	1992.54	1328.51	3891.19	3278.35	2246.73	1761.62
07/2019	2002.03	1337.86	3907.24	3066.10	2261.36	1772.52
08/2019	1947.68	1310.48	3866.83	2928.97	2118.35	1759.84
09/2019	2052.47	1286.87	3907.84	3099.72	2145.53	1767.76
10/2019	2141.57	1308.27	4015.37	3191.15	2179.56	1777.40
11/2019	2190.07	1343.62	3952.67	3194.38	2191.29	1787.66
12/2019	2241.02	1358.37	4173.36	3229.11	2323.07	1813.59

Annex 3: The monthly growth rate of HFRX in selected countries and areas

	Japan	North America	China	India	Russia	Aggregate
Date	Monthly Rate of Return					
02/2005	1.33%	1.35%	3.96%	2.73%	6.91%	2.11%
03/2005	0.47%	-0.59%	-1.93%	-1.04%	-3.93%	-0.77%
04/2005	-1.64%	-1.62%	-2.13%	-2.10%	-2.85%	-1.33%
05/2005	0.79%	1.32%	-1.39%	3.23%	-0.55%	1.00%
06/2005	1.18%	2.08%	-0.38%	3.46%	4.03%	1.34%
07/2005	0.55%	2.16%	2.32%	2.89%	4.64%	2.22%
08/2005	2.21%	1.06%	-2.61%	2.38%	7.25%	1.20%
09/2005	5.17%	0.59%	2.34%	7.15%	14.63%	2.19%
10/2005	3.38%	-0.84%	-4.99%	-6.49%	-5.30%	-1.63%
11/2005	5.66%	1.25%	4.05%	4.65%	6.05%	1.86%
12/2005	9.26%	1.12%	4.55%	4.30%	5.27%	2.01%
01/2006	0.63%	1.72%	9.88%	7.43%	11.79%	3.70%
02/2006	-3.50%	0.11%	5.00%	0.56%	5.69%	0.25%
03/2006	2.31%	1.14%	7.15%	10.09%	-0.22%	1.71%
04/2006	-2.15%	1.46%	3.29%	8.35%	7.75%	2.13%
05/2006	-4.61%	0.16%	-2.15%	-9.24%	-5.50%	-1.64%
06/2006	-0.61%	0.38%	-1.18%	-3.94%	-0.82%	-0.46%
07/2006	-0.62%	0.95%	-1.24%	-1.81%	2.36%	-0.12%
08/2006	1.51%	0.75%	-0.41%	5.32%	2.53%	0.98%
09/2006	-0.25%	0.36%	1.78%	4.82%	-2.78%	0.12%
10/2006	0.05%	2.05%	3.55%	8.14%	3.19%	1.94%
11/2006	-1.34%	1.25%	5.01%	7.23%	8.57%	2.10%
12/2006	1.44%	1.17%	5.63%	3.22%	7.40%	2.21%
01/2007	1.57%	1.01%	1.04%	2.02%	0.83%	1.03%
02/2007	-0.32%	0.87%	3.86%	-5.77%	1.59%	0.35%
03/2007	-1.91%	1.16%	0.53%	-2.36%	5.39%	1.00%
04/2007	-0.32%	0.14%	3.00%	5.99%	0.86%	1.86%
05/2007	1.26%	1.09%	6.24%	8.86%	-1.53%	2.08%
06/2007	1.34%	0.69%	3.64%	3.08%	3.95%	1.41%
07/2007	-0.11%	-1.85%	8.61%	5.01%	1.72%	0.84%
08/2007	-3.01%	0.49%	-0.27%	-1.20%	-3.25%	-2.25%
09/2007	1.74%	1.80%	10.60%	11.53%	2.34%	2.45%
10/2007	-0.02%	1.98%	7.07%	12.32%	4.77%	3.17%
11/2007	-2.62%	-0.55%	-7.04%	2.91%	0.36%	-2.09%

12/2007	0.36%	-0.03%	1.60%	8.67%	2.58%	0.76%
01/2008	-6.65%	-2.64%	-6.83%	-11.09%	-4.15%	-2.69%
02/2008	-0.03%	1.03%	3.47%	-3.61%	2.77%	2.30%
03/2008	-4.23%	-2.03%	-6.56%	-10.62%	-2.34%	-2.14%
04/2008	3.19%	2.13%	2.48%	5.72%	1.62%	1.37%
05/2008	2.71%	1.71%	0.36%	-5.85%	7.58%	1.42%
06/2008	-1.97%	-1.81%	-6.31%	-11.94%	-4.37%	-1.11%
07/2008	-0.45%	0.61%	-0.34%	0.19%	-7.57%	-1.90%
08/2008	-0.35%	0.76%	-5.64%	-2.13%	-7.94%	-1.65%
09/2008	-2.96%	-2.44%	-7.20%	-10.32%	-14.56%	-5.44%
10/2008	-2.51%	-4.11%	-5.35%	-13.62%	-18.55%	-6.70%
11/2008	-0.47%	-1.55%	0.28%	-5.48%	-5.41%	-1.60%
12/2008	1.24%	0.87%	4.10%	3.41%	-6.10%	-0.11%
01/2009	-1.43%	1.05%	3.06%	-3.12%	-10.03%	0.66%
02/2009	-0.93%	0.54%	1.83%	-5.00%	-1.85%	-0.58%
03/2009	-1.06%	-0.15%	8.05%	4.29%	9.48%	1.00%
04/2009	1.89%	-1.67%	7.47%	9.80%	12.84%	1.27%
05/2009	1.61%	2.96%	7.71%	30.39%	15.07%	3.11%
06/2009	1.61%	-2.14%	3.51%	-3.17%	-3.44%	0.29%
07/2009	0.70%	0.32%	5.98%	3.09%	6.16%	1.61%
08/2009	1.08%	1.27%	-1.90%	0.90%	2.95%	0.74%
09/2009	-0.79%	2.40%	2.08%	5.03%	10.05%	2.10%
10/2009	-2.42%	-1.39%	1.25%	-2.04%	5.31%	0.44%
11/2009	-1.09%	2.49%	1.32%	4.00%	3.83%	1.06%
12/2009	0.31%	-0.29%	1.66%	1.88%	3.28%	0.93%
01/2010	3.00%	0.00%	-1.44%	-1.07%	3.30%	-0.19%
02/2010	0.26%	0.09%	-0.28%	-1.27%	-2.04%	0.16%
03/2010	4.21%	0.67%	0.98%	6.68%	9.77%	1.94%
04/2010	3.27%	1.20%	1.09%	3.91%	2.91%	0.74%
05/2010	-5.53%	-2.57%	-4.15%	-6.68%	-9.72%	-2.53%
06/2010	-2.15%	-0.47%	-0.75%	1.26%	-2.28%	-0.54%
07/2010	1.26%	1.41%	2.05%	3.23%	3.35%	1.68%
08/2010	-3.55%	-0.66%	1.38%	1.30%	-1.45%	-0.06%
09/2010	1.98%	1.15%	6.78%	8.34%	5.79%	2.67%
10/2010	-0.28%	0.57%	1.49%	1.99%	2.93%	1.38%
11/2010	1.61%	-0.14%	2.27%	-5.36%	0.38%	0.19%
12/2010	4.49%	1.07%	-0.07%	3.21%	6.54%	1.93%
01/2011	1.40%	1.50%	-0.73%	-8.32%	1.72%	0.45%
02/2011	2.54%	1.46%	-0.60%	-2.44%	2.31%	1.01%

03/2011	-3.34%	-0.04%	1.25%	4.64%	1.97%	0.23%
04/2011	-0.03%	0.89%	1.79%	2.62%	0.36%	0.92%
05/2011	-0.07%	-0.63%	-1.70%	-3.07%	-2.79%	-0.79%
06/2011	-0.32%	-0.53%	-2.01%	-0.55%	-1.76%	-0.73%
07/2011	0.44%	-0.75%	2.62%	0.69%	1.64%	0.13%
08/2011	-4.35%	-3.14%	-3.37%	-11.78%	-9.78%	-3.37%
09/2011	-1.70%	-2.42%	-2.62%	-8.21%	-7.50%	-3.18%
10/2011	-0.36%	1.26%	-0.27%	2.07%	7.83%	2.36%
11/2011	-3.58%	-0.83%	-1.56%	-14.99%	-1.70%	-0.82%
12/2011	2.64%	0.09%	-2.96%	-9.48%	-4.24%	-0.20%
01/2012	1.02%	1.75%	0.39%	16.83%	6.54%	1.69%
02/2012	3.68%	0.79%	1.29%	5.80%	5.85%	1.51%
03/2012	0.46%	0.06%	-0.62%	-3.59%	-1.29%	0.13%
04/2012	-1.25%	-0.01%	-0.31%	-1.62%	-1.71%	0.05%
05/2012	-2.73%	-3.00%	-2.38%	-10.13%	-10.13%	-1.93%
06/2012	2.52%	0.86%	1.09%	3.64%	2.42%	0.25%
07/2012	-0.51%	1.66%	-0.49%	1.32%	1.50%	0.99%
08/2012	0.63%	0.69%	0.65%	-0.10%	-0.73%	0.49%
09/2012	1.59%	0.91%	1.72%	10.72%	4.51%	0.77%
10/2012	0.36%	-0.15%	0.71%	-1.71%	-1.37%	0.00%
11/2012	1.23%	0.87%	2.39%	4.80%	-0.55%	0.48%
12/2012	0.91%	0.97%	4.77%	1.25%	2.48%	0.87%
01/2013	5.60%	2.89%	6.88%	2.07%	4.04%	1.99%
02/2013	2.26%	0.32%	0.92%	-8.56%	-2.14%	0.39%
03/2013	3.43%	0.92%	-0.87%	-0.87%	-4.63%	0.83%
04/2013	8.09%	-0.02%	1.22%	4.29%	-1.57%	0.85%
05/2013	-0.48%	2.47%	3.75%	-2.73%	-2.23%	0.65%
06/2013	-1.20%	-1.41%	-5.22%	-7.57%	-3.04%	-0.86%
07/2013	2.02%	2.60%	0.71%	-4.02%	0.59%	1.14%
08/2013	-0.84%	-1.15%	0.46%	-10.86%	-0.84%	-0.87%
09/2013	4.31%	2.17%	2.61%	7.95%	3.90%	1.23%
10/2013	1.67%	1.49%	3.05%	8.19%	0.99%	1.28%
11/2013	1.54%	0.72%	3.14%	0.86%	-1.98%	0.57%
12/2013	2.68%	0.97%	1.38%	5.38%	2.26%	0.84%
01/2014	-0.15%	-0.78%	-0.77%	-4.96%	-9.73%	-0.22%
02/2014	-1.41%	1.85%	2.62%	3.93%	0.69%	1.29%
03/2014	-0.06%	0.62%	-3.13%	6.46%	-3.69%	-0.11%
04/2014	-0.40%	-0.49%	-2.74%	1.69%	-0.12%	-0.27%
05/2014	0.46%	0.15%	1.31%	8.99%	9.07%	0.79%

06/2014	2.27%	1.28%	2.07%	6.96%	4.48%	1.07%
07/2014	1.31%	-1.73%	1.79%	0.85%	-7.45%	-0.41%
08/2014	1.04%	1.40%	1.43%	3.69%	-4.15%	0.76%
09/2014	1.20%	-2.22%	-1.11%	2.77%	-2.84%	-0.47%
10/2014	-0.90%	-2.68%	0.76%	3.89%	-3.31%	-0.76%
11/2014	1.90%	-1.00%	-0.31%	3.18%	-6.59%	0.02%
12/2014	-0.08%	-0.50%	0.36%	1.71%	-12.25%	-0.45%
01/2015	-1.62%	-1.74%	-0.16%	6.23%	-1.29%	0.07%
02/2015	0.80%	3.08%	1.07%	1.08%	8.91%	1.63%
03/2015	0.46%	0.45%	2.98%	-1.33%	-0.61%	0.58%
04/2015	3.11%	0.27%	16.64%	-3.79%	6.56%	0.97%
05/2015	1.43%	0.21%	1.20%	1.88%	-1.24%	0.46%
06/2015	1.20%	-0.45%	-3.90%	-0.30%	-2.61%	-0.86%
07/2015	-0.15%	-0.12%	-9.72%	3.45%	-1.98%	0.05%
08/2015	-0.78%	-2.32%	-6.33%	-6.17%	-4.54%	-1.60%
09/2015	-1.08%	-4.14%	0.92%	1.75%	-1.68%	-1.39%
10/2015	2.48%	2.98%	4.60%	0.81%	6.45%	1.50%
11/2015	1.96%	-3.91%	0.28%	-0.64%	0.63%	-0.29%
12/2015	0.16%	-3.74%	0.95%	1.62%	-6.29%	-0.76%
01/2016	-2.45%	-2.23%	-8.62%	-8.18%	-1.75%	-1.74%
02/2016	-2.41%	-0.15%	-1.89%	-6.51%	1.03%	-0.31%
03/2016	3.06%	2.10%	4.29%	11.77%	9.10%	1.64%
04/2016	-0.82%	0.25%	0.01%	2.26%	3.81%	0.97%
05/2016	1.67%	0.94%	-1.77%	1.41%	-1.07%	0.59%
06/2016	-1.74%	-0.46%	-0.23%	2.78%	0.60%	0.35%
07/2016	0.70%	1.61%	3.55%	4.41%	1.25%	1.35%
08/2016	-1.14%	0.51%	3.26%	1.90%	2.15%	0.46%
09/2016	0.22%	0.43%	1.76%	-0.03%	2.05%	0.62%
10/2016	1.74%	-0.08%	-0.14%	1.89%	1.00%	-0.04%
11/2016	0.88%	1.37%	-0.53%	-6.33%	1.79%	0.20%
12/2016	0.42%	-0.16%	-2.29%	-0.53%	6.25%	0.62%
01/2017	1.24%	0.82%	2.93%	5.49%	3.09%	1.00%
02/2017	0.79%	0.81%	3.68%	5.40%	-2.53%	0.77%
03/2017	0.25%	0.45%	3.43%	7.07%	1.24%	0.35%
04/2017	0.10%	0.43%	1.79%	4.40%	1.51%	0.43%
05/2017	2.34%	-0.21%	0.53%	0.90%	-1.76%	-0.12%
06/2017	1.03%	0.39%	2.84%	0.97%	-1.50%	0.23%
07/2017	0.72%	0.29%	1.74%	4.01%	2.33%	0.94%
08/2017	0.86%	-0.06%	1.27%	-0.23%	6.30%	0.44%

09/2017	2.57%	1.57%	3.07%	-0.83%	1.51%	0.68%
10/2017	1.51%	-0.52%	5.58%	3.12%	-0.43%	0.56%
11/2017	0.64%	0.40%	2.53%	2.67%	-0.86%	0.13%
12/2017	1.16%	-0.01%	1.73%	3.72%	2.15%	0.84%
01/2018	0.83%	2.59%	5.70%	1.26%	6.86%	1.94%
02/2018	-0.87%	-2.87%	-2.05%	-3.89%	-0.54%	-1.31%
03/2018	-0.98%	-0.71%	-0.66%	-2.37%	-2.16%	-0.42%
04/2018	-0.03%	0.39%	-2.74%	4.09%	-4.81%	0.32%
05/2018	-0.72%	0.31%	3.53%	-4.32%	-2.18%	0.07%
06/2018	-1.10%	-0.15%	-4.83%	-5.59%	-0.80%	-0.27%
07/2018	0.18%	0.10%	-3.27%	2.87%	0.79%	0.46%
08/2018	-0.13%	-0.26%	-4.61%	0.69%	-7.12%	-0.51%
09/2018	-0.05%	-0.73%	-3.47%	-13.21%	4.91%	-0.20%
10/2018	-3.72%	-3.82%	-10.43%	-3.80%	-3.95%	-2.14%
11/2018	0.39%	-0.23%	3.54%	8.55%	-2.34%	-0.44%
12/2018	-4.29%	-2.36%	-4.47%	-1.54%	-3.92%	-1.71%
01/2019	2.36%	2.73%	5.26%	-5.02%	6.90%	2.60%
02/2019	0.76%	-0.56%	5.19%	-2.86%	-0.45%	0.60%
03/2019	-0.31%	-1.85%	4.11%	12.75%	0.18%	0.36%
04/2019	0.75%	1.16%	0.53%	-2.59%	2.50%	0.90%
05/2019	-1.46%	-0.24%	-7.09%	2.68%	-0.35%	-0.57%
06/2019	0.61%	1.06%	4.21%	-1.75%	5.44%	1.26%
07/2019	0.48%	0.70%	0.41%	-6.47%	0.65%	0.62%
08/2019	-2.71%	-2.05%	-1.03%	-4.47%	-6.32%	-0.72%
09/2019	5.38%	-1.80%	1.06%	5.83%	1.28%	0.45%
10/2019	4.34%	1.66%	2.75%	2.95%	1.59%	0.55%
11/2019	2.26%	2.70%	-1.56%	0.10%	0.54%	0.58%
12/2019	2.33%	1.10%	5.58%	1.09%	6.01%	1.45%